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PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Aten means the Original Patented Asbestos Dryer Felt but asbestos dryer felt does not mean Aten

DEC. 8 1938

Vol. CVI No. 23

UNIVERSITY OF WASHINGTON SEATTLE

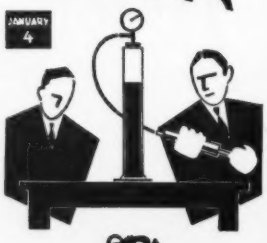
W. C. HAMILTON & SONS, *makers of fine papers,*

HAD A STREAM POLLUTION PROBLEM

here's how they solved it at a profit

THEIR PURCHASING AGENT WROTE TO US:

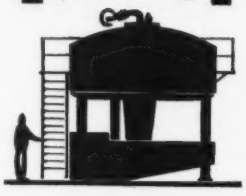
"We have a condition of discharging our waste water into the river. It has become necessary to handle the situation better than we have been doing, and we would like to have one of your representatives discuss this problem with us."



OUR ENGINEER MADE TESTS AT THEIR MILL:

Using a portable test kit, our engineer gave an advance demonstration of what the ADKA could do.

Because these tests were made in the client's own plant at Miquon, Pa.—on fresh whitewater samples from their own paper machines—Hamilton officials were convinced the ADKA could do the job.

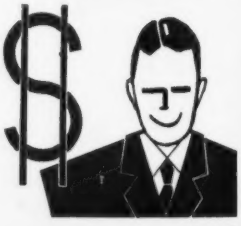


AN ADKA SAVEALL WAS INSTALLED WITH THESE RESULTS:

Eight hundred gallons per minute of whitewater from five paper machines are treated. Fiber and filler are re-used—clarified water discharged to the Schuylkill River.

Tests were run by W. C. Hamilton engineers on September 28th. From 8:00 A.M. to 4:00 P.M. samples of ADKA effluent were taken every 30 minutes. Under the conditions then prevailing, these results were obtained:

	Suspended Solids—Lbs./1000 gals.		
	Fiber	Filler	Total
ADKA effluent	0.12	0.21	0.33



THEY MADE A PROFIT:

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Why not ask our engineer to make a demonstration for you? Results may be equally gratifying.

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ARGENTINA: Luis Fiore, Buenos Aires • SOUTH AFRICA: Edward L. Bateman Pty. Ltd., Johannesburg • BRAZIL: Oscar Taves & Co., Rio de Janeiro

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PAPER TRADE JOURNAL

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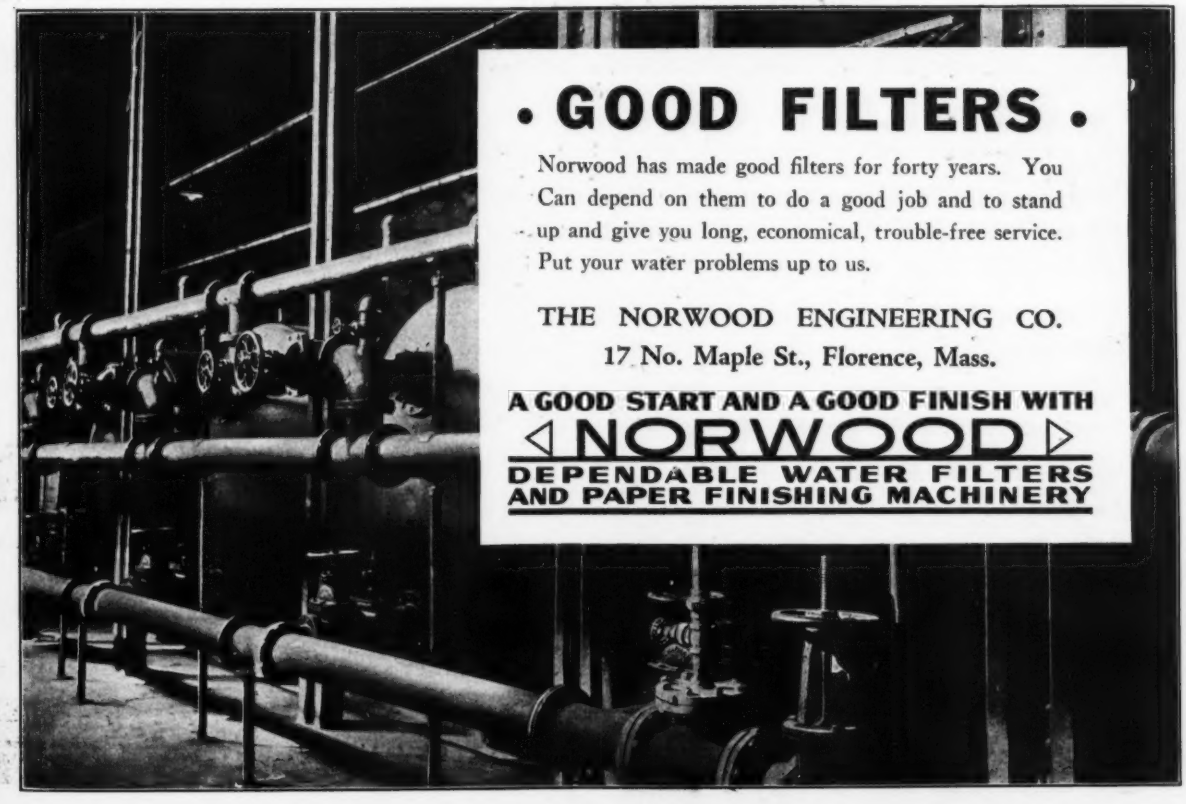
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Norwood has made good filters for forty years. You Can depend on them to do a good job and to stand up and give you long, economical, trouble-free service. Put your water problems up to us.
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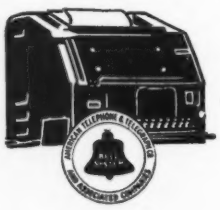

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PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

SIXTY-SEVENTH YEAR

PAPER — PIONEER

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Bowaters To Increase Pulp Production

Expansion of Cornerbrook Newfoundland Mill Instead of Building New Plant Agreed Upon By Bowater-Lloyd and Commissioner of Natural Resources—Prices of Fine Paper Reduced — Other Late Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 5, 1938—A despatch from Newfoundland states that the Hon. R. B. Ewbank, Commissioner of Natural Resources, has announced the terms of an agreement between Newfoundland's Commission of Government and Bowater-Lloyd (Newfoundland) Limited by which the company undertakes to extend its Cornerbrook plant instead of building a mill in the heart of the heavily-timbered Gander Lake area, as was sought by the Government.

Government Grants Concessions

In exchange for rights to cut wood for export, the Bowater-Lloyd interests will establish facilities for increased pulp production at the Cornerbrook site, recently acquired from International Power and Paper Company. The Government will also grant the company certain concessions in tariffs, export duties, taxation and water power rights.

The commissioner announced terms of the agreement, relating to operation of the Gander Lake Timber limits, in a broadcast address. The limits were purchased from Reid-Newfoundland Limited subject to approval by the Commission of Government.

Under the 99-year agreement the company will extend the Cornerbrook plant, increasing the annual output by 30,000 tons by December, 1941. The increased production will be started as soon as economically possibly.

The company will cut for export in 1938-39 a minimum of 50,000 cords of "unmanufactured" wood. Any shortage in this cut will make them liable for a penalty of 25 cents a cord.

After extension of sulphite production facilities, the company may export two cords of pulpwood for every ton of paper manufactured in excess of the normal output.

Until the new plant has operated for a period of three years, the company may export 70,000 cords of wood annually. It will pay a royalty of 30 cents a cord on all exported raw timber but will be exempted from export duties.

Prices of Fine Paper Reduced

In anticipation of what are regarded as the extremely difficult competitive conditions that will obtain as from January 1st next, when the reductions in duties provided for in the new Canada-U. S. trade agreements become effective. Canadian fine paper manufacturers have effected a further general reduction in prices, the second in the past few months. The latest reductions, which embrace sulphite bond, all high-grade and magazine-book paper lines, range from $7 to $20 a ton. Early in October prices were reduced $10 to $20 a ton on certain grades of fine paper that account for about 95 per cent of the volume used in ordinary commercial forms. At that time manufacturers stated that the revision in prices was in no way based on cost but entirely in an effort to meet extremely keen competition from United States manufacturers. In the new price list, No. 5 bond paper is reduced by ¾c a pound, or $15.00 a ton, making a total reduction of $30 a ton since early October. No. 4 bond is down ½c a pound or $10.00 a ton, following a reduction of $20.00 a ton early in October. All the high-grade paper lines are down 1c a pound, or $20.00 a ton. In the book-magazine grades, prices are down ¾c a pound or $7.00 a ton. Removal of the 3 per cent excise tax will make the American competition that much keener.

To Produce Paper in Tasmania

According to a report to the Department of Trade and Commerce from Frederick Palmer, Canadian Trade Commissioner at Melbourne, plans are under way for the production of newsprint and other paper in Tasmania. Following large scale tests of the suitability of Tasmanian woods for the manufacturing of different types of paper. Consideration has been given, he reports, to the erection of two pulp and paper mills, one located in the northwestern part of the island which is shortly to begin production of writing and wrapping papers, and one in the south for the production of newsprint.

Hoskin Paper Co. Adds Filter Plant

[FROM OUR REGULAR CORRESPONDENT]

MENOMINEE, Mich.—Construction work has been completed on a filter plant by the Hoskin Paper Company. Installation of equipment has been started, and the plant is expected to be ready for operation by January 1. The work has been done under the supervision of L. A. De Guere, architect and engineer of Wisconsin Rapids, Wis.

Assets Transferred to Fox River Paper Corp.

Newly Organized Company Formally Acquires Assets of Fox River Paper Co.—William C. Wing and Son To Retire As New Officers Are Elected—Institute of Paper To Meet In New York — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 5, 1938—Formal transfer of the assets of the Fox River Paper Company, Appleton, Wis., to the newly organized Fox River Paper Corporation was completed November 30 and operations were begun by the new owners December 1, after a week's shutdown since Thanksgiving Day to complete inventory.

The mills were purchased September 12 by a new corporation headed as president by E. A. Oberweiser, formerly president and general manager of the Whiting-Plover Paper Company, Stevens Point, Wis., and the intervening time has been devoted to the transfer to the new owners. The other officers are M. E. Roberts, formerly of Chicago, executive vice-president; R. F. Bellack, Neenah, Wis., vice-president; D. E. Oberweiser, a son of the president, treasurer, and William Roberts, son of the executive vice-president, secretary.

William Wing and Sons Retire

William C. Wing, president of the Fox River Paper Company for more than twenty years, and William C. Wing, Jr., vice-president, are retiring from the company. No other changes in personnel are contemplated for the present.

The company has been one of the largest manufacturers of rag content papers in the United States, and one of the major paper mill properties in Wisconsin, employing more than 400 persons. Vice-president Bellack announces that new markets will be sought to build up the company's business. Product improvements are being studied but there is to be no immediate change in the types of paper made. The officers are already well-known to the market nationally as sales and merchandising men, and expect to expand operations as soon as increased business warrants.

The transfer involves the Fox River mills, the Telulah mill, the former Patten Paper Company property and all the water power rights owned by the Fox River Paper Company. The Patten buildings will be used for storage purposes.

Pulp and Paper Mills More Active

Pulp and paper mills in the Seventh Federal Reserve district, which includes Wisconsin, showed increased activity in October as compared to September and also as compared to the same period in 1937, according to George J. Schaller, president of the Federal Reserve Bank of Chicago.

New orders booked in tons by the paper mills increased eight per cent from September and gained 18.4 per cent over October of 1937. In dollars, new orders booked in October were 13.1 per cent above September but only 1.9 per cent above October of 1937.

Total production of the paper mills showed a gain of 2.2 per cent in tons during October as compared to September, and an increase of 6.3 per cent over the same 1937 month.

Further evidence of improvement is shown in reports of the Wisconsin Industrial Commission at Madison, Wis. Ninety-four paper and paper products manufacturers reporting showed that there was a total of 16,765 employees on the payrolls for August, a gain of 0.1 per cent over the previous month, and that in September there were 16,936 on the payrolls, a gain of 1.4 per cent over August. Payrolls for August were up five per cent, totalling $418,835, but were down 1.8 per cent in September, with a total of $410,217, presumably because of holiday shutdowns. The box industry gained 3 per cent in September over August, the paper and pulp mills 1.2 per cent, and the paper products plants 1.5 per cent. Average hourly earnings in September were 60.8.

Labor Board Designates Bargaining Agent

Color mixers and machine printers employed at the Kimberly-Clark Corporation's Atlas mill at Appleton, Wis., a converting plant for wall paper, will be represented in collective bargaining by the United Wall Paper Craftsmen of North America (AFL affiliate), according to a decision of the National Labor Relations board at a meeting in Washington, D. C. last week. Union memberships were compared with company payrolls. J. Warren Madden and Donald W. Smith, of the board, voted in favor of the proposal, and Edwin S. Smith against it. The board also designated the unaffiliated Wall Paper Workers Union of the Fox River Valley as the bargaining agent for the hourly paid workers exclusive of the AFL skilled workers' group.

Institute of Paper Trustees To Meet in New York

A regular meeting of the board of trustees of the Institute of Paper Chemistry, Appleton, Wis., will be held at Barclay hotel, New York City, on Thursday morning, December 8. Dr. Thomas N. Barrows, president of Lawrence College and director of the Institute, Westbrook Steele, executive director, and other staff members will attend. Ernst Mahler, executive vice-president of Kimberly-Clark Corporation, Neenah, Wis., is chairman of the board.

Wisconsin Paper Group Hold Meeting

A meeting of the Wisconsin Paper Group, with offices at Neenah, Wis., was held November 29 at Conway hotel, Appleton, Wis. Thirty representatives of cooperating mills were present for the dinner. Matters pertaining to the pool car shipment of products of member mills were discussed.

1,300 Enroll in Safety School

Approximately 1,300 men and women are enrolled in a safety school conducted by the vocational school at Wausau, Wis. The first meeting was held November 28, with Max Gene Nohl of Milwaukee, Wis. as the speaker. He is the diver who has gone fur-

ther beneath the surface of the sea than any other person. Large numbers of workers from the Marathon Paper Mills Company, the Mosinee Paper Mills Company, and the Wausau Paper Mills Company are among those enrolled. Three additional meetings will be held to complete the series.

Fox River Traffic Club Dinner

The Fox River Valley Traffic Club held its annual dinner at Hotel Raulf, Oshkosh, Wis., November 22, with 110 present. A slate of nominees for 1939 was presented, and the officers will be chosen by the executive committee. Leo Schubart of the Neenah Paper Company, Neenah, Wis., is now serving as president. An address was made by A. C. Wiechering, mayor of Oshkosh, who urged cooperation between various cities to provide better transportation facilities.

C. H. Worcester Elected a Trustee

Charles Henry Worcester of Chicago, Ill., president of the Munising Paper Company, Munising, Mich., has been elected a trustee of Lawrence College, Appleton, Wis., with which the Institute of Paper Chemistry is affiliated. Mr. Worcester is vice-president of the Chicago Art Institute, and in 1937 was awarded an honorary degree by Lawrence College. His election took place at a special meeting of the board of trustees at the college last week.

Recommends Continuing Dexter Plant

DEXTER, N. Y., December 3, 1938.—Following a meeting of directors of the Dexter Sulphite Pulp and Paper Company with debenture bond holders this week it was announced that no decision concerning the disposition of the property had been reached and another meeting is scheduled for next week. Whether it will then be determined to continue the operation of the mill or liquidate the assets and divide the proceeds among the creditors cannot be determined. Attorney Raymond Cornwall, representing the First National Bank, recommended continued operation of the mill because of its vital importance to the community. At the meeting here the directors rendered a report of the management of the mill during the past four years. The company has about $230,000 in cash and receivables and a suggestion was made that there be made application for another loan from the Reconstruction Finance Corp. to insure continued operation of the mill. Of the $371,000 in debenture notes the Northern New York Trust Co., holds about $70,000, the Watertown National Bank about $36,000 and the Jefferson County National Bank a similar amount.

It was stated that negotiations are still pending through agents with Canadian interests which are considering purchase of the properties.

Buys Machinery in Perseverance Mill

F. P. Lyden, who recently opened an office at 11 West 42nd street, to handle used machinery, last week purchased all the paper mill machinery in the Perseverance Paper Mill at Lambertville, N. J., which has been idle for some time past. The plant will not hereafter be used for the manufacture of paper, but it is believed will be occupied by a textile concern.

Census of Envelopes Manufactures

A slight increase in employment and a moderate increase in production and wages in the Envelopes industry in 1937, as compared with 1935, are shown in the preliminary figures compiled from returns of the recent Biennial Census of Manufactures just released by Director William L. Austin, Bureau of the Census, Department of Commerce.

The total value of all products made in the industry in 1937, $51,289,922, exceeds the 1935 figure, $43,618,372, by 17.6 per cent. The number of wage earners in 1937 was 9,511, an increase of 5.2 per cent over the 9,038 reported for 1935, and their wages increased 15.6 per cent from $9,086,718 in 1935 to $10,502,815 in 1937.

This industry, as classified for Census purposes, embraces establishments engaged wholly or principally in the manufacture of envelopes of any description, including those used for filing, wrapping, etc.

The table below gives summary statistics for 1937, 1935, and 1933. The figures for 1937 are preliminary and subject to revision.

SUMMARY FOR THE INDUSTRY: 1937, 1935, AND 1933
(Because they account for a negligible portion of the national output, plants with annual production valued at less than $5,000 have been excluded since 1919)

	1937	1935	1933	Percent of increase or decrease(—) 1935-1937	1933-1937
Number of establishments	162	166	163	—2.4	—0.6
Wage earners (average for the year) [1]	9,511	9,038	7,981	5.2	19.2
Wages [1]	$10,502,815	$9,086,718	$6,754,947	15.6	55.5
Cost of materials, supplies, containers, fuel, and purchased electric energy [2]	$25,106,584	$20,752,636	$15,917,974	21.0	57.7
Products, total value [2]	$51,289,922	$43,618,372	$33,895,511	17.6	51.3
Envelopes [3]	$46,265,140	$40,022,926	$31,571,177	15.6	46.5
Other products	$5,024,782	$3,595,446	$2,324,334	39.8	116.2
Value added by manufacture [4]	$26,183,338	$22,865,736	$17,977,537	14.5	45.6

[1] Not including salaried officers and employees. Data for such officers and employees will be included in a later report. The item for wage earners is an average of the numbers reported for the several months of the year. In calculating it, equal weight must be given to full-time and part-time wage earners (not reported separately by the manufacturers), and for this reason it exceeds the number that would have been required to perform the work done in the industry if all wage earners had been continuously employed throughout the year. The quotient obtained by dividing the amount of wages by the average number of wage earners cannot, therefore, be accepted as representing the average wage received by full-time wage earners. In making comparisons between the figures for 1937 and those for earlier years, the possibility that the proportion of part-time employment varied from year to year should be taken into account.

[2] Profits or losses cannot be calculated from the Census figures because no data are collected for certain expense items, such as interest, rent, depreciation, taxes, insurance, and advertising.

[3] In addition, envelopes are made to some extent in establishments engaged primarily in other lines of manufacture. The value of such products for 1935 was $2,031,412; for 1933, $1,521,821. Corresponding figures for 1937 are not yet available but will be shown in a later report.

[4] Value of products less cost of materials, supplies, containers, fuel, and purchased electric energy.

Employees Given Hospitalization

All employees of the firm of Peter J. Schweitzer, Inc., paper manufacturers of Newark avenue, Elizabeth, N. J., have been given a full year of protection in the Hospital Service Plan of New Jersey.

The company not only provided this non-profit insurance against hospital bills for its workers, but extended it to include the immediate families of the employees.

In a statement made today, Mr. Louis Schweitzer, an official of the firm, pointed out that his organization considers this gift to be an investment in the general welfare of the company.

Earl Rowe Heads the Great Lakes Paper Co.

Leader of Conservative Party In Ontario Elected President of the Great Lakes Paper Co., Succeeding C. H. Carlisle Who Resigned — Company's Shipments 16,000 Tons Above Prorating Plan — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 5, 1938—The biggest surprise of the past week in paper circles was the election of Hon. Earl Rowe, M. P., as president and director of the Great Lakes Paper Company, Limited, Fort William, Ont. He succeeds C. H. Carlisle, who recently resigned as a protest against the prorating policy of the Ontario government. The name of Mr. Rowe was not among those mentioned in connection with the presidency. He is widely known in political circles and recently resigned as leader of the Conservative party in the province of Ontario. Officially expressed view of the company is that the long experience of Mr. Rowe in matters of public relationship should be of great value to the company. Early reaction to the appointment of Mr. Rowe indicated a belief that it meant continued opposition of the company to the prorating of newsprint production and that the fight was still on with the Ontario government and the rest of the industry, but it is understood that such is not the case. Mr. Rowe says that so far as he can in the interest of the company he will cooperate with the Ontario government. It is understood that the operating staff of the company will not be disturbed. L. J. Heit will continue as general manager and Charles England as secretary-treasurer.

The officials of the company are unwilling to hazard any forecast as to what effect on the company's earnings the looked for changes in its sales will mean. The general view is that nothing will be done to endanger the ability of the company to cover bond interest during normal periods and that there may be chances of a balance of earnings for the preferred shares. Hon. Peter Heenan, Minister of Lands and Forests for Ontario, said that President Rowe had signified his willingness to carry on and follow the plans of the newsprint industry so far as was in his power. There are matters still under negotiation however that will have a vital effect on the future.

Shipments Over Prorating Plan

According to Mr. Heenan, the Great Lakes Company shipped about 16,000 tons of newsprint over and above the amount that the company would have been able to ship in the first eleven months of 1938 if it had been conforming to the prorating plan. He indicated that the Ontario government plans to make its enforcement of prorating on the company retroactive to the beginning of 1938. This means that some way has to be found, not only of assurance that the Great Lakes Company will regulate its productions and shipments to the average of the industry in future, but also some method whereby this 16,000 tons of "overshipment" can be adjusted with other producers.

A conference was held during the past week in Toronto between Hon. Mitchell Hepburn, Premier of Ontario, Hon. Peter Heenan, Minister of Lands and Forests and Charles Vining, president of the Canadian Newsprint Association, Montreal, in regard to the pro rata agreement on newsprint production. It is said that other matters under discussion were the Lake Sulphite Pulp Company, Red Rock, Ont., which was brought before the last session of the Legislature and the long unsettled situation of the Abitibi Power & Paper Company.

Reactions To New Trade Treaty

Printers and publishers in Ontario feel that they have been called upon to make undue sacrifices while securing only minor compensation under the terms of the new Anglo-American trade treaty. One leading firm said that no other industry has been hit so hard. Printers, lithographers and others who bring in paper from the United States, are benefitted on certain items. Coated paper is reduced from thirty two and a half per cent to twenty seven and a half per cent and the excise tax is eliminated. Imports from the United States last fiscal year amounted to $48,785 but are said to have greatly increased in recent months. Imports of paper of all kinds, not otherwise provided for and which include glazed or unglazed surface coated papers, amount to a larger figure. For the year ending March, 1938, the value was $248,392. Only the excise tax is removed. The duty remains at twenty-two and a half per cent. A number of firms fear that increased competition will handicap their business to the extent that labor will be materially affected.

Officials of the Hinde & Dauch Paper Company of Canada, who have plants in Toronto and Trenton, Ont., are disturbed over the possible effect of the recent revisions of the tariff in the trade agreement between the United States and Great Britain. Duty on corrugated shipping containers is down approximately eight per cent and on paper board five and a half per cent, allowing for the removal of the three per cent excise tax.

Canadian International Mill Reopens

The plant of the Canadian International Paper Company, Hawkesbury, Ont., which was closed down over three weeks ago has resumed operations and more than four hundred men have returned to work. The plant has been idle on several occasions since the first of the year for periods of one to three weeks.

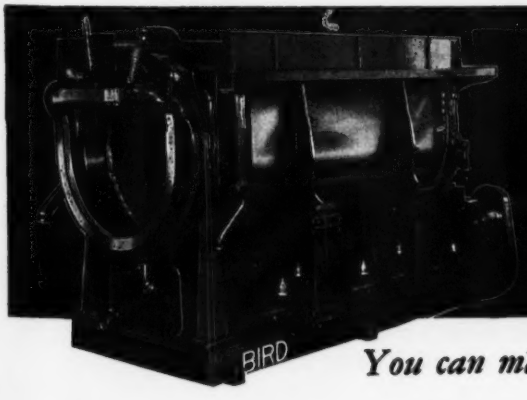
Ernest G. Ralph Goes To Canada Glazed Paper

Ernest G. Rolph, sales manager of the Alliance Paper Mills, Limited, Toronto, has resigned to assume his new duties as vice president and manager of Canada Glazed Paper, Limited, who are launching a factory at 45 McMurrich St., Toronto, which will make a wide range of coated papers and will be in production early in the new year. Mr. Rolph, who is widely known in the industry, was for some years on the advertising staff of the Howard Smith Paper Mills. He was given a handsome cigaret case on leaving the service of the Alliance Paper Mills.

They want it **CLEAN!**

Right now your customers are fussier than ever. They emphatically do not want dirt in their paper. Isn't that right? . . . The surest, lowest cost way to keep old customers and get new ones is to put in an up-to-date installation of new Bird Screens with the capacity to permit thorough screening action with finer cut screen plates. Ask us to prove it.

BIRD MACHINE COMPANY, SOUTH WALPOLE, MASS.



BIRD SCREENS

You can make more money with new Bird Machinery!

News of the Middle West Paper Trade

Readjustment In Sulphite Bond Prices About Cover Reductions Made Several Weeks Ago As Paper Trade Situation Improves—Midwest S.A.-P.I. Plan Christmas Party—Milk In Paper Containers — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 5, 1938—The readjustment in the sulphite bond market which sent prices up sufficiently to just about cover the drastic reductions of three weeks ago, still had local outfits in the midst of readjustments but ready to report that the reaction was only natural because the previous cut was not justified and willing to indicate that improved demand plus added costs of production should send the market to still stronger ground.

Business, locally, has improved as colder weather made its appearance. All grades gave evidence of a healthier appearance. Book and cover markets showed fair support while groundwoods and newsprints were giving a satisfactory account of themselves. The kraft market, it is reported, remained in the unfortunate position of enjoying 80 to 90 per cent capacity production without any resultant strengthening in the market base. Even here, however, the outlook was reported bright.

Specialties responded to seasonal demand and the entire market gave evidence of a belief that 1939 would be a materially better year. Waste papers were little changed over last week.

S.A.P.I. Plan Xmas Party

The midwest division of the Salesmens Association of the Paper Industry will hold its annual Christmas party during the week between Christmas and New Years with Ben Babbitt of the Brown Company again chairman in charge of all arrangements.

Industry Comparisons in Federal Reserve Report

Reports from the Seventh Federal Reserve District pulp and paper mills for October show some increase in activity over September and comparisons with 1937 continued favorable in the paper industry. The following summary is provided by the District which includes the States of Wisconsin, Michigan, Illinois, Indiana and Iowa:

PAPER AND PULP INDUSTRY
SEVENTH DISTRICT

	October, 1938 Per cent Change from September, 1938	October, 1937
Paper:		
New orders booked (tons)	+ 8.9	+18.4
New orders booked (dollars)	+13.1	+ 1.9
Total shipments (tons)	+ 2.2	+ 7.4
Total shipments (dollars)	+ 1.7	+ 2.9
Total production (tons)	+ 2.2	+ 6.3
Stocks on hand at end of month (tons)	+ 6.6	+10.2
Pulp:		
Pulp produced (tons)	+ 6.8	— 0.3
Stocks on hand at end of month (tons)	— 3.1	— 2.7

Sell Milk in Paper Containers

Sales of grade A milk in paper containers, prohibited in Chicago by health authorities, have been started in several suburbs north and west of the city. Health regulations in these suburbs permit the use of such containers and in these spots the milk will be retailed through chain stores with future home delivery procedure not as yet decided upon. Only one major concern is handling milk in this way at this time but at least two major Chicago milk distributors have informed retail outlets that they, too, will soon supply milk in paper containers.

Use of the paper containers will make no difference in price but the companies interested in developing the procedure report that it will make unnecessary a deposit required by most stores on glass bottles.

Paper Conditions Improve

Conditions favorable to the paper and printing industry were reported this week by the federal reserve district representing Iowa, Indiana, Illinois, Wisconsin and Michigan. The 747 reporting firms reported 73,871 wage earners for the week of October 15 with earnings totaling $2,122,000. The percentage of wage earners as compared to September 15 reached an improvement of 1.3 per cent while earnings increased 4.2 per cent during the same period. This compares to a 6.4 per cent increase in wage earners and a 12 per cent increase in earnings for the total manufacturing, ten groups.

Crossett To Distribute Own Products

It has been reported by the Crossett Paper Mills that the arrangement whereby the Chicago concern of H. J. Andrews Paper Company has represented the Mills in this territory has been discontinued. The discontinuation comes as the result of Crossett plans to distribute through its own sales force.

B. C. Hopper Elected a Director

B. C. Hopper, president of the Hopper Paper Company of Taylorville, Illinois, has recently been elected a director of the Illinois Chamber of Commerce. This will be Mr. Hopper's first term on the board of directors composed of thirty-six leading business executives from all parts of the State.

Shipping Tag Simplified Practices

Local trade is interested in the recent announcement from the National Bureau of Standards indicating approval of a first revision of recommendations for simplified practices in the manufacture of paper shipping tags. The revision, proposed by the Tag Manufacturers Institute, covers sizes of shipping tags and paper stocks used in their manufacture. Four tables are included, showing fibre content, weight, thickness and Elmendorf tear for manila tag stocks, kraft and dyed stocks, coated stocks and white lined stocks. Mimeographed copies of the proposed revision may be obtained from the Bureau of Standards in Washington.

Gaylord Container Increase Power

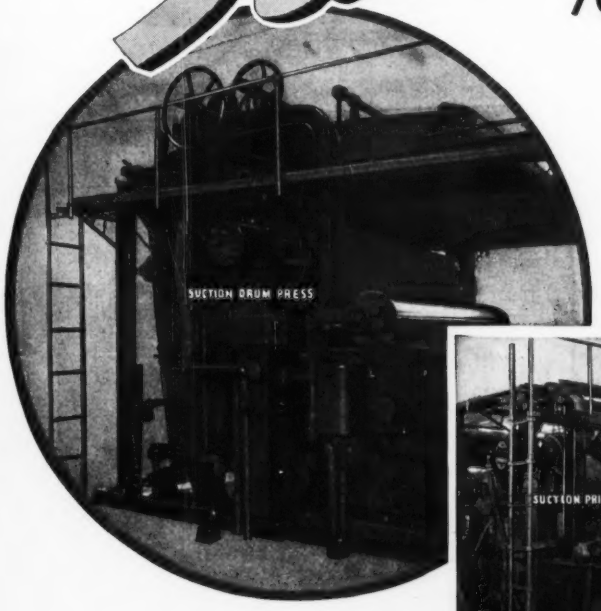
[FROM OUR REGULAR CORRESPONDENT]

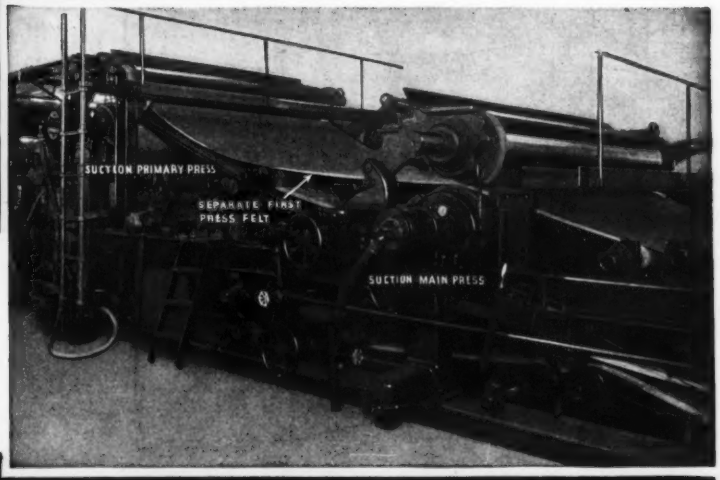
MILWAUKEE, Wis.—Construction has been started by the Gaylord Container Corporation on an addition to its boiler room. It will be of brick and concrete, 26 by 56 feet in size, and will provide additional power capacity with the most modern boilers. The company recently leased a large amount of manufacturing space in the former Eline plant.

Suctionize

YOUR BOARD MACHINE WITH Beloit SUCTION

DRUM PRESS *
PRIMARY PRESS
MAIN PRESS





Note the short top felt for suction drum press nip. All plain primaries have been removed.

Wet pickup felt returns after suction primary press. Suction first press is on separate felt.

1. Removes large quantity water without disturbing formation or finish.
2. Reduces crushing and checking.
3. Improves finish. Reduces felt marks.
4. Permits use of light weight short top felt. Lower felt cost.
5. Eliminates several nips. Improves test of board.
6. Permits more bulk if desired.
7. Increases test or permits cheaper furnish and maintain same test.
8. Suction main press more efficient on separate felt.

* Suction drum press is equivalent to suction drum and suction primary press.

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS, BELOIT, WIS.

Financial News of Pulp and Paper Industry

National Gypsum Co. Offers 60,000 Shares of $4.50 Preferred Stock — Bathurst Co. Directors Declare An Interim Dividend of 25 Cents Per Share—Rayonier, Inc., Shows Net Profit of $64,895 For Three Months.

NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending December 7, 1938

	High	Low	Last
A. P. W.	3¼	2⅝	2⅝
Armstrong Cork Co.	52	49¾	51¼
Celotex Corp.	16¼	12⅝	15⅝
Celotex Corp., pf.	67½	67½	67½
Certain-Teed Products Corp.	10¼	9½	10
Certain-Teed Products Corp., pf.	41⅝	37	41
Champion Paper & Fibre Co.	31	28	29
Champion Paper & Fibre Co., pf.	103	100	103
Congoleum-Nairn Co.	27	26¼	26⅞
Container Corp. of America	14⅝	14	14⅝
Continental-Diamond Fibre Co.	9¾	9⅛	9⅛
Crown-Zellerbach Co.,	13¼	12⅝	13
Crown-Zellerbach Co., pf.	90	86	86¼
Flintkote Co.	26⅞	25¼	26¼
Robert Gair	3⅞	3½	3⅞
Robert Gair, pf.	12⅝	11¼	12½
International Paper & Power	13¼	11⅝	12¾
International Paper & Power, pf.	47¼	42¾	46
Johns-Manville Corp.	101¾	99	101
Johns-Manville Corp., pf.	128	126	128
MacAndrews & Forbes	29	29	28¾
Masonite Corp.	54¾	52¾	53½
Mead Corp.	11½	11¼	11¼
Mead Corp., pf.	67	67	67
Paraffine Companies, Inc.	58½	58	58
Paraffine Companies, Inc., pf.	100	99½	99½
Ruberoid Co.	31¼	29⅞	30
Scott Paper Co.	49¾	48½	48½
Sutherland Paper Co.	30	30	30
Union Bag & Paper Corp.	12½	11¾	12¼
United Paperboard Co.	7⅛	7	7¼
U. S. Gypsum Co.	108½	103½	108½
U. S. Gypsum Co., pf.	172½	172½	172½

NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending December 7, 1938

	High	Low	Last
American Box Board Co.	9⅜	9⅜	9⅜
Brown Co., pf.	21	20½	21
Great Northern Paper	39	37½	38
St. Regis Paper Co.	3⅛	2⅞	2⅞
Taggart Corp.	4⅞	4¾	4¾

National Gypsum Offers New Issue

A banking group headed by W. E. Hutton & Co. offered publicly last week a new issue of 60,000 shares of $4.50 convertible cumulative preferred stock of the National Gypsum Company at $100 a share. Other members of the group are Blyth & Co., Inc.; Hemphill, Noyes & Co.; Johnson, Lane, Space & Co., Inc.; Schoellkopf, Hutton & Pomeroy, Inc.; Hallgarten & Co., E. H. Rollins & Sons, Inc.; W. C. Langley & Co., Riter & Co., William R. Staats Company, J. M. Dain Co. and Cochran, Murray & Co.

Of the net proceeds from this financing the company will use $3,505,617 to retire all its 7 per cent first preferred stock and $1,150,683 to retire the 5 per cent second preferred. The company also plans to use an estimated $900,000 for additions to its New York plant and $350,000 toward purchase of land adjoining that plant.

The new preferred stock will be convertible into common stock at 17 for the first year through November 30, 1939, thereafter at 20 through November 30, 1941, thereafter at 23 through November 30, 1943, and thereafter at 26 through November 30, 1945, when the conversion privilege ends.

The stock will be redeemable in whole or part on thirty days' notice at $105 a share to November 30, 1943, and at $103 thereafter.

Bathurst Declares Dividend

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 5, 1938.—directors of Bathurst Power and Paper Company have declared an interim dividend of 25 cents per share on the 400,000 class "A" shares outstanding. This dividend will be payable December 19 to shareholders of record December 10.

A similar interim dividend of 25 cents per share was declared last year.

R. L. Weldon, president of the company, in an interview following the meeting stated that the operating volume of the company had shown a steady improvement over the past six months and indications were that this improvement would be continued into 1939.

"The business of the company," stated Mr. Weldon, "has, of course, been affected by the conditions prevailing generally in the pulp and paper industry, but there is good reason to expect an improvement in operations for the coming year, and evidence of this is already seen in an increasing demand for our products for both domestic and expert consumption.

"I might add that the strong financial position of the company has been maintained, and the declaration of this interim dividend is in line with the conservative policy adopted by the directors."

Rayonier, Inc. Earns $64,895

Rayonier, Inc., showed a net profit of $64,895 for the three months ended on October 31, after provision for depreciation, expenses and other charges, according to a report issued yesterday. No provision was required for Federal income, excess profits for undistributed surplus taxes, due to the net loss reported during the first quarter year.

In the preceding quarter the company had a net loss of $183,264. The profit shown in the last report cut Rayonier's net loss for the first six months of its current year to $118,369.

Rayonier began business on November 2, 1937, as a consolidation of three former independent companies engaged in similar lines of activity. For the six months ended October 31, 1937, combined net profits of the predecessor companies totaled $2,285,866.

Canada Glazed Papers Get Charter

A charter has been granted to Canada Glazed Papers, Limited, with headquarters in Toronto with a capital divided into one thousand five hundred six per cent cumulative preference shares of the par value of one hundred dollars each and thirty thousand common shares without par value. Herman W. Weis, of Oakville, is the president of the new organization. E. G. Rolph, late of the Alliance Paper Mills, Toronto, is vice president. It is expected that production will start at the company's location at 45 McMurrich

St., Toronto, early in the new year. A large, vertical type coating machine is now being installed and additional equipment will be added in the near future. The company will produce a wide range of coated papers, many of which are now imported. The lines will be box covers, magazine covers, label papers, etc. The new plant is designed to produce annually 1,250 tons of high quality glazed paper.

Crown Zellerbach Earns $2,338,608

The Crown Zellerbach Corporation and subsidiaries, engaged in the producing and selling of paper and paper products, reported a net profit of $2,338,608 after all charges for depreciation, depletion, interest and taxes and with allowance for minority stockholders' proportion of the net profit of Pacific Mills, Ltd., according to the report for the six months ended on October 31. In the corresponding period last year $4,440,801 was earned.

The result is equivalent to 44 cents each on the 2,261,199 shares of $5 par common stock outstanding, after deducting full dividend requirements on $5 new cumulative convertible stock for the six months, and compares with $1.37 a share correspondingly in 1937.

Bids on New Wausau Power House

[FROM OUR REGULAR CORRESPONDENT]

BROKAW, Wis.—Tentative bids were taken recently on a concrete dam and new power house for the Wausau Paper Mills Company. The bids were found to compare reasonably with estimates furnished by L. A. De Guere, architect and engineer of Wisconsin Rapids, Wis., as to cost of replacement of the company's dam and power plant which collapsed earlier this year. Further contact is being made with the Reconstruction Finance Corporation at Washington, D. C., relative to a loan to finance the project. No further decision is expected until about January 1st. The mill is now being operated with the aid of an old crib dam formerly abandoned.

Champion Reports $10,946 Profit

The Champion Paper and Fibre Company and Subsidiaries report for twenty-eight weeks to Nov. 6 a net profit of $10,946, equal to 14 cents each on 77,483 shares of 6 per cent preferred stock, against $1,403,562, or $2.10 a share, for the common stock last year. Twelve weeks to Nov. 6; Net profit, $162,848, equal, after preferred dividend requirements, to 10 cents each on 551,000 no-par common shares, against $481,075, or 69 cents a common share, last year.

A. P. W. Paper Co. Report Loss

A. P. W. Paper Company, Inc. reports as follows for the September quarter: Net loss, $1,735. No provision made for Federal income tax or surtax on undistributed profits. Company's fiscal year ends on June 30. Net loss in September quarters of 1937 was $1,389.

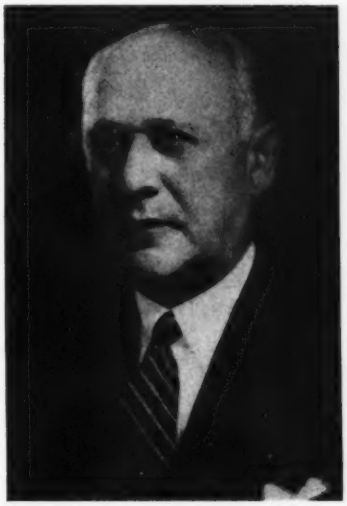
United Wall Paper Loss

United Wall Paper Factories, Inc., reports for two months to Aug. 31, a net loss of $154,293. Fiscal year of company ends on June 30.

Testimonial Dinner for Abraham Herman

Members of the setup paper box, folding carton and corrugated container industries will sponsor a testimonial dinner for Abraham Herman at the Hotel Astor on the evening of January 10, 1939.

By that time Mr. Herman, who is secretary of the Moon & Herman Hat Box Company, Inc., New York, and the National Container Corporation, Long Island City, will have completed forty active years in the box and container industries.



ABRAHAM HERMAN

Mr. Herman was recently elected president of the Hias, an international philanthropic and welfare organization for the thirteenth time.

New Paper Mill Supply Company

[FROM OUR REGULAR CORRESPONDENT]

NEENAH, Wis.—The Chemical Supply Company has been organized here and has established an office and warehouse at 305 Railroad St. The owners are Eric D. Lindberg, who was secretary and general manager of the former Patten Paper Company, Ltd., Appleton, Wis., and W. C. Comee, formerly sales manager for the Northern Chemical Company.

The company will stock industrial chemicals and supplies for paper mills and other industries and will establish truck delivery to the Fox and Wisconsin River Valleys. It will operate the only chemical warehouse north of Milwaukee.

Hooker Co. To Erect Building

The Hooker Electrochemical Company is about to erect a new office and administration building, in connection with its main plant, at Niagara Falls, New York. When completed, some time next year, its principal executive offices will be transferred from the Lincoln Building, 60 East 42nd Street, to Niagara Falls. The Company will continue to maintain a New York Office. It is understood that this move is being made in order to concentrate the supervision of Operation, Sales, Research and Development at one place, for better service and greater efficiency. It has another plant at Tacoma, Wash.

Power Show Opens With Varied Exhibits

Scientific Development of Products and Equipment Engineered To Meet Exacting Requirements of Industry Displayed On Three Floors At the Grand Central Palace — Many Products In Paper Industry Exhibited.

The Thirteenth National Exhibition of Power and Mechanical Engineering opened at the Grand Central Palace, New York, on December 5 and will be continued until the 10th. The 293 exhibits are grouped on the first three display floors of the building. One of the interesting features and the keynote of the exposition are the dynamic exhibits of instruments and controls. Another example of how practical and applied science has entered modern industrial plants is found in the equipment for eliminating boiler room guesswork through the use of combustion instruments and controls and by the utilization of various refractory materials for attaining higher efficiency in the generating of power.

Industrial testing machines, automatic and semi-automatic starters, speed switches, motor operated valves, lubricating systems, ball and swivel joints, filters, turbines, insulating materials, a varied display of power transmission devices, ball and roller bearings, corrosive resisting metal alloys, comprise a few of the many interesting exhibits.

Of particular interest to the paper and pulp industry are the displays of companies whose products are well known through installations in many mills throughout the country and which are briefly summarized in the following list of individual companies.

Allis-Chalmers Mfg. Co.

The feature at the exhibit of the Allis-Chalmers Manufacturing Company is a model of the Port Washington, Wis. unit power station, consisting of one boiler and one condenser, with economy curve showing a world's high record for economy. The company's Akron turbines for extraction and feed water treatment equipment are shown, with a complete line of motors, speed reducers and Texrope drives.

Bailey Meter Co.

At the display of the Bailey Meter Company, diagrams clearly explain the Bailey combustion and feed water control to modern boilers by an operating exhibit. The company's Synchro remote recording meter is also displayed, including types of meters for measuring the distribution of water and steam.

Baker-Raulang Co.

The late type of truck exhibited by the Baker Industrial Truck Division of the Baker-Raulang Co., is known as the Tilting Telescoping Fork Truck, the hoist telescoping to pass through a door 7 feet in height. Baker motor trucks are much used for handling all sizes and weights of paper rolls and when fitted with revolving roll handlers, picks up, turns, vertically and horizontally, rolls and tiers them. On the average run, the company states one man can handle 50 tons of paper an hour.

Carborundum Co.

The featured exhibited of the Carborundum Company shows Carbofrax silicon carbide base brick for lining clinker-liner boilers. It can be used for the fire face of air-cooled boiler walls, either solid or of perforated construction. Another utilization is for a fire face protection on water tube boilers. Carbofrax No. 3 and No. 4 Cement for painting or patching fire brick is also displayed.

Cash Co.

The feature at the exhibit of the Cash Company is the Type 50 Bourdon Tube Pilot Controller and Type 30 Diaphragm Motor Valve for pressure reduction, pressure relief, etc., controlling all fluids.

Chase Brass & Copper Co.

The display of the Chase Brass and Copper Company features large welded fittings fabricated of Olympic bronze, with welded seams, in sizes up to 16 inches in diameter, an alloy highly resistant to caustics and acids. Olympic bronze bolts and nuts, and a large line of copper tubes and fittings are also shown.

Cleveland Worm & Gear Co.

As the only company in the world manufacturing worm gears exclusively, the Cleveland Worm and Gear Company exhibit special types of worm gear drives, such as used as sectional drives on paper machines, agitators, and stock chests. The Farval Corporation, a subsidiary of the company, displayed the Farval transparent automatic pump lubricating system, adapted for bearings requiring a metered quantity of oil and grease.

Crane Co.

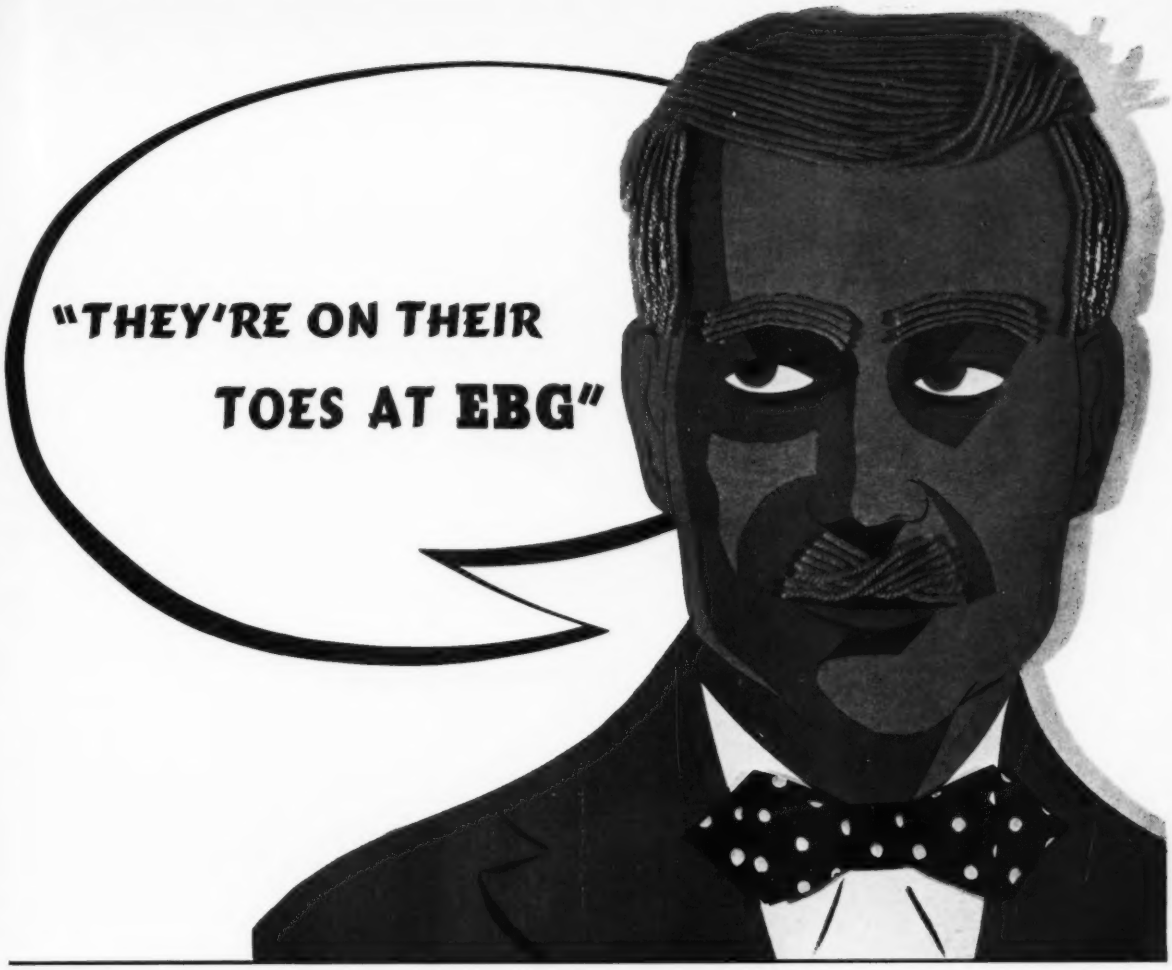
Crane Company displayed the new Cast Steel Motor Operated Valve, with welded bonnet and welded ends for 2500 pounds S.W.P.—1000F. A shop fabricated, cast steel carbon Moly Header for welding, for pressures of 1500 pounds, S.W.P.—950F., was also exhibited with the usual line of conventional type valves.

E. I. du Pont de Nemours & Co.

The exclusive product featured at the exhibit of E. I. du Pont de Nemours & Co., was Neoprene, a new synthetic rubber-like material suitable for forming drying rolls and printing rolls. This new material, also known as Chloroprene Rubber, is made from the basic materials of coal, limestone and salt, and Chloroprene palmerizes to form Neoprene. It is stated to possess high merit in the preparation of molded and engraved printing plates.

Graton & Knight Co.

Research Leather Belting is demonstrated at the exhibit of the Graton & Knight Company. A belt testing dynamometer developed by the company tests high quality leather scientifically constructed and that of ordinary commercial leather. The demonstrations indicate the marked difference in the efficiency of various brands of belting and reveal the advantages of using scientifically made belting as an economy in obtaining higher transmission service.



● Being the first to produce liquid chlorine in the U. S. A. was only a first "first" for EBG. Other firsts include the introduction of liquid chlorine to the sterilization of water and the treatment of sewage ...paper bleaching...textile bleaching...and the bleaching of shellac. As other applications are constantly being discovered for this important product, and the field of its usefulness widens, EBG continues its pioneering activity. That's why customers say, "They're on their toes at EBG!"

ELECTRO BLEACHING GAS COMPANY

MAIN OFFICE: 60 EAST 42nd STREET, NEW YORK, N. Y. • PLANT: NIAGARA FALLS, N. Y.

EBG Liquid Chlorine
FIRST IN THE COUNTRY

Grinnell Co.

The Grinnell Company exhibit features Thermolier unit heaters, automatic sprinklers, and pre-fabricated piping. A varied line of welding fittings, humidifying devices for temperature control, and pipe fittings are also displayed.

International Nickel Co.

At the exhibit of the International Nickel Company, the recently perfected heat treatable grades of high nickel alloys are shown. These include K-Monel in rolled forms, S-Monel in cast forms, and Z-Monel in rolled forms. It is stated that these alloys are distinguished by hardness above 300 Brinnell, the hardness being retained up to 1000 F.

Leeds & Northrup Co.

The display of the Leeds & Northrup Company feature the company's industrial type Frequency Recorder Controller, a self-contained unit designed for plants requiring no skilled or technical attention. It is stated to be simple to install and operate and can be applied to one or several units in motor unit stations. A Gas Continuous Recording Analyzer for CO_2 and SO_2, for low maintenance and constant accuracy is also exhibited.

Link-Belt Co.

Featured equipment at the exhibit of the Link-Belt Company include operating units of P.I.V. variable speed units, motorized reducers, silent chain drives, and worm gear reducers. Anti-friction bearings for every power transmission service were also displayed.

Morse Chain Co.

The display of the Morse Chain Company featured Free Wheeling Clutches used for the dual drives of turbines and motors, and silent types of flexible chain couplings.

Nash Engineering Co.

At the exhibit of the Nash Engineering Company, featured items included the company's new compressors and vacuum pumps for higher pressures and vacuums.

Norton Co.

The Norton Company exhibited a line of Crystalon refractories for boiler furnace linings, and Alundum grinding wheels of the same materials. Norton abrasives, showing wide applications to many industries were also displayed.

Patron Millwright & Transmission Co.

The Patron Millwright and Transmission Company, represented in three booths the products of the Ohio Gear Company, B. F. Goodrich Company, T. B. Woods Sons, Ahlberg Bearing Company, Union Gear and Machine Company, Equipment Engineering Company, and Reeves Pulley Company. All types of gears, speed reducers, V-belt drives, chain drives, power transmission machinery, ball bearing equipment and conveyor supplies were displayed.

B. F. Perkins & Son

The exhibit of B. F. Perkins & Son, Inc., manufacturers of calender rolls and paper machinery for 62 years, including the Mullen Paper Tester, featured the Variducer, a new machine combining variable speed with a straight reduction from 350 to 50 r.p.m. This equipment is also made to suit the various applications of customers.

Republic Flow Meters Co.

The display of the Republic Flow Meters Company featured flow meters for measuring water and steam, temperatures, pressures, and remote reading instruments. Boiler control instruments and regulators, designed for maintaining constant steam pressure and to automatically maintain high boiler efficiency, were also exhibited.

Revolvator Co.

At the exhibit of the Revolator Company were shown automatic and semi-automatic Revolators for the handling of rolls of paper between floors. Another type of equipment was displayed for handling cases, and a roll paper truck for handling rolls. A third type of lift truck was shown for handling sheets of paper on skids.

J. E. Rhodes & Sons

The featured display of J. E. Rhodes & Sons, was Rhodes Stannate Leather belting, scientifically manufactured to provide a high gripping quality of surface to give higher transmission power. The belting is treated to resist heat and dilute caustic and acid solutions. A three-ply belt for the transmission of power from paper machine to cone pulleys was pictorially shown.

SKF Industries, Inc.

At the exhibit of SKF Industries, Inc., was featured the S-A Type Pillow Block, using self-aligning roller bearings for use on back drives. Ball and roller bearings for table couch, press, felt, and wire rolls and dryer cylinders were also displayed.

Tide Water Associated Oil Co.

The exhibit of the Tide Water Associated Oil Company, featured a full line of industrial lubricants against a background portraying the important part which scientifically engineered Tycol oils and greases perform in modern industrial plants.

Walworth Co.

At the exhibit of the Walworth Company, a 10-inch motor operated 1500 pound steam pressure welded bonnet and welded ends valve, was displayed. A wood pulp valve of chrome nickel iron, corrosive resistant to caustics and acids, was also shown. A 10-inch conventional type motor operated valve, with Cutler-Hammer equipment, a standard line of brass valves and fittings were also exhibited. Another item shown was a 6-inch non-freeze tank valve, with fusable link to automatically close in case of fire.

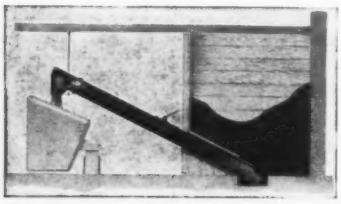
Discusses Sales of Envelopes

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 5, 1938.—A sales meeting was held at the office of John Carter & Co., Inc., November 26, at which envelopes and the problems of selling were discussed by Mr. Wright, of the general sales office of the United States Envelope Company, Springfield, Mass., and Messrs. Townsend and Nelson, of the Logan, Swift & Brigham Envelope Company Division, Worcester, Mass. Leon N. Poor, of John Carter & Co., Inc., presided.

New Automatic Loader

An automatic loader to fill stoker hoppers is new equipment added to their line of machinery items by D. J. Murray Manufacturing Company, Wausau, Wis. With a capacity up to 10 tons of coal per hour, this loader can be adjusted to meet stoker room requirements; distance from the coal pile only governs the length of the loader. Illustrated here is the model suspended from the ceiling, but it can be supported by a stand from the floor, if desired, and can also be furnished for right- or left-hand operation. In principle and operation this loader is simple, safe and dependable as a labor-saving device; sturdily built it has nothing to get out of order and nothing to maintain. It uses electricity only the few minutes necessary to fill the stoker hopper, and is equipped with 1½ hp. motor. Especially designed for use in modern office and public buildings, industrial plants, etc. It is patented in the United States.



Growing and Marketing Pulpwood

The Florida Forest and Park Service, Tallahassee, Fla., has just issued Bulletin No. 12, under the title of *Growing and Marketing Pulpwood in Florida*. The publication points out that a new and profitable use for timber in Florida has been created by the large pulp and paper mills now in operation in that state. It also advises that pulp mills use all species of native pines and that it is more profitable to use trees under 10 inches for pulpwood at $1 per unit, than it is to use the same trees for sawlogs at a stumpage rate of $3 per thousand feet. The bulletin contains much practical information in a compact form for owners of timber lands in marketing their timber.

To Rehabilitate China Paper Mills

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 30, 1938—Preparations have been made by the Oji Paper Manufacturing Company, which practically monopolizes the Japanese wood pulp and paper industries, for the rehabilitation of the existing paper plants in Central China, according to a report. Kichinosuke Muta, chief of the Chosen paper plant of the Oji Company, recently visited Central China to make a detailed survey of the paper industry and discovered that seven or eight paper mills in that area might resume operations easily.

Sell Caslon Papers in Des Moines

The Munising Paper Company announces the appointment of Bermingham & Prosser Company, 112-10th street, Des Moines, Iowa as distributors of the Caslon lines.

Caslon Bond, Munising's watermarked sulphite bond, as well as Caslon Mimeograph Bond and Caslon Ledger are completely stocked by Bermingham & Prosser in white, the wide array of colors, and special finishes.

Stocking Parsons Scotch Linen Ledger

Shapiro Paper Corporation announces that it has added Parsons Scotch Linen Ledger to its extensive lines of ledger papers. This paper represents the highest quality ledger paper manufactured by Parsons Paper Company of Holyoke, Mass., and for many years has been the standard for number one rag ledger where the utmost in quality is wanted.

Parsons Scotch Linen Ledger is a number one, 100 per cent rag ledger made from all new white rag cuttings. Its extensive range of sizes and weights is most interesting, as it is available in white, buff, and blue, in Substance 16, 20, 24, 28, 32, 36, and 44 inclusive, in a large number of sizes. A complete line is now being stocked to insure prompt service. Attractive sample books are being issued.

New Hose Data Book

A compact data book, containing valuable information on the selection, care and use of industrial rubber hose, has been published by New York Belting and Packing Company, of Passaic, N. J. Copies of the data book may be obtained from distributors of N. Y. B. & P. Mechanical Rubber Goods.

This new data book lists nearly sixty types of rubber hose used by industry today; defines fundamental terms and explains their relationship to hose structures; gives suggestions for increasing the service life of hose; describes and illustrates principal types of hose construction; contains tables of recommended working pressures, and includes a frictional pressure drop and flow chart.

Liebeck Fibrator

The Liebeck Fibrator, a product of E. D. Jones & Sons Company, Pittsfield, Mass., for some time now has been in use in large 5,000 lb. units which have been very successful in mills requiring large capacity pulping systems. These units however have been too large to be of any use in other types of mills until recent development has made possible the use of units of such size as to accommodate a beater or a pair of beaters furnishing stock at 5 per cent to 7 per cent consistency. With these Fibrator units installed in the beater room equipped with a conveyor belt to feed in the sheet pulp by the bale and a pump and pipe line feeding the beaters, it is possible to eliminate most of the handling and prepare and charge the beater with suitable pulped stock in less than ten minutes.

Wood Pulp

Wood Pulp is the title of a 209 page book and the second volume in a new series of plant science books just published by Chronica Botanica Company, Leiden, Holland, and G. E. Stechert & Company, New York. The book is written by Julius Grant and is a general presentment of the nature of wood pulp, structure and preparation of wood fiber and the evaluation of pulping woods. The contents also includes the various steps in the process of manufacturing mechanical, sulphite, sulphate, and rayon pulps, together with the chemical processes now in use in the pulp industry. An index is a convenient addition to this useful and informative contribution on the subject of wood pulp. The price is 7 guilders or approximately $4 a copy.

Obituary

Edmund C. Westervelt

Edmund Corlett Westervelt, 91, retired paper manufacturer, died at the home of his daughter, Mrs. David R. Vaughn, 115 South Franklin place, South Bend, Ind., on November 19, after an illness of six months.

Born in Mansfield, O., Mr. Westervelt was the son of Rev. W. A. Westervelt, a Congregational clergyman. He studied at Washington College, Washington, Ia., and later took a business course at Oberlin College. He operated a grocery business in Oberlin for six years, then temporarily retired to travel extensively in Europe and the East.

Attracted by the business possibilities of South Bend while on his wedding journey, Mr. Westervelt opened a grocery store there and later erected a pulp mill at Mishawaka. In 1880 he established the South Bend Paper Company with a plant on the West Race and the St. Joseph river. For a time he continued as a partner and then purchased full control of the business. In 1892 he founded the Prairie State Paper Company at Taylorville, Ill., and served as president of the company. In 1894 he organized the Atlas Paper Bag Company and became its president. He was also treasurer of the Chicago Indurated Fibre Company. In his earlier years he was active in the First Presbyterian Church.

Surviving are two daughters and two brothers. Mrs. Westervelt died many years ago.

Augustus Gibson Paine Jr.

Augustus Gibson Paine Jr., who retired in 1935 as president of the Castenea Paper Company, with offices in New York at 230 Park Avenue, died of pneumonia, Thursday, December 1, in Tucson, Ariz. He was forty-eight years old.

Mr. Paine had been in ill health since 1935. He was a member of the Union, Racquet and Tennis, St. Anthony and Turf and Field Clubs. He was also a former vice-president and director of the New York and Pennsylvania Company, paper manufacturers.

Surviving are his father, two daughters, Mrs. Walter Stirling of Phoenix, Ariz., and Mrs. Marvin Evenson of New York, and a son Alva Jordan Paine. Mr. Paine's wife, Mrs. Dorothy Quimby Paine, died last year.

Percy P. Ford

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 5, 1938—The death occurred of Percy P. Ford, assistant purchasing agent of St. Lawrence Paper Mills, Limited, Three Rivers, Que. Mr. Ford was fatally stricken with a heart attack on the street on his way home. He was in his 39th year and had been in the employ of the St. Lawrence Paper Mills for the past 15 years.

The son of the late Mr. and Mrs. Rolland Ford, of Portneuf, he came from a family well known in the paper-making industry. His grandfather was the late Joseph Ford, who was one of the first paper mill operators in Canada and whose mills are still in operation at Portneuf.

He is survived by his wife, the former Dorothy D. Hughes, of Montreal; by one son, Peter; and by three brothers and eight sisters.

Henry W. Stokes

Henry W. Stokes, a retired paper manufacturer, died of a heart attack November 30 at his home in Media, Pa. He was 71 years old.

Graduated from Haverford College in 1887, he was president from 1909 to 1929 of the York Haven Paper Company. He was president of the American Paper and Pulp Association in 1924 and 1925.

He was a director of the Provident Mutual Life Insurance Company, president of the Sleighton Farms School, a member of the board of managers of Haverford College and of the board of trustees of Dunwoody Home, Newtown Square. Survivors are a son, J. Tyson Stokes of Media. His wife the former Helen Tyson, died in 1933.

George R. Tower

George Reddington Tower, 77, a former Boston paper manufacturer, died suddenly in Cambridge, Mass., November 26. His residence was at 65 Langdon street, that city.

Mr. Tower was born in Vassalboro, Me., and until his retirement 15 years ago, operated a paper manufacturing business in Boston which his father, the late William Howard Farwell Tower, had established. His widow, Mrs. Lillian L. Tower; a son, William R. Tower of Newtonville, Mass., and a daughter, Mrs. Albert S. Crockett of Winchester, Mass., are living.

George B. Thomas

George Brooks Thomas, 62, a member of the firm of C. H. Thomas & Co., paper merchants, Springfield, Mass., died November 29 at his residence, 82 Wilson road, North Andover, Mass.

Mr. Thomas was born in Watertown, Mass. He was a deacon of Trinity Church, Lawrence, Mass., and at one time general secretary of the Y. M. C. A. in Lawrence and Fitchburg, Mass.

His widow, Mrs. Grace S. Thomas; a daughter, Mrs. J. Edmund Elliot of North Andover, and two brothers, Charles H. and Fred G. Thomas of Springfield, are living.

James W. Knox

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 5, 1938—James W. "Jim" Knox, for thirty eight years a member of the Chicago paper industry, died at the Edward Hines Hospital on November 10. For the last three years Mr. Knox had been manager of the Chicago office of the Standard Paper Manufacturing Company and prior to that time had spent 35 years with the Chicago Paper Company, first as an employee and later as an officer. Jim Knox was an enthusiastic member of the Salesmens Association of the Paper Industry and widely known in paper circles as well as in the American Legion in which he was an active member.

Fire Damages Robertson Co. Plant

HINSDALE, N. H., December 5, 1938—The plant of the Robertson Company, manufacturer of tissue paper, of which F. W. Jeffords is president and C. B. O'Neal treasurer, was damaged by fire last week. The damage is estimated at several thousands of dollars.

Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 7, 1938 — The Government Printing Office has received the following bids for 5,000 pounds (200,000 sheets) of 50 per cent rag, 21 x 32, pink manifold paper; Whitaker Paper Company, 16.8 cents; Barton, Duer & Koch Paper Company, 16.79 cents; Import Paper Company, 27 cents; Mudge Paper Company, 16.73 cents; R. P. Andrews Paper Company, 16.95 cents; Marquette Paper Company, 17 cents; and Walker, Goulard Plehn Company, 16.79 cents.

For 10,000 pounds No. 2 kraft wrapping paper, 24 x 36; Cauthorne Paper Company, 3.2 cents; Bradner & Smith Company, 3.25 cents; Walker, Goulard Plehn Company, 3.11 cents; Andrews Paper House of York, 3.31 cents; Enterprise Paper Company, 3.25 cents; Paper Corp. of U. S., 3.25 cents; Mathers-Lamm Paper Company, 3.39 cents (all or none); Stanford Paper Company, 5 cents; R. P. Andrews Paper Company, 3.43 cents; Barton, Duer & Koch Paper Company, 3.92 cents; Old Dominion Paper Company, 3.398 cents; Perkins Goodwin Company, 3.24 cents; Whitaker Paper Company, 3.185 cents; Mudge Paper Company, 3.24 cents; and Graham Paper Company, 3.5 cents.

For 48,000 pounds (200,000 sheets) of No. 2 kraft wrapping paper, 36 x 48; Cauthorne Paper Company, 3.44 cents; Bradner & Smith Company, 3.5 cents; Walker, Goulard Plehn Company, 3.36 cents; Andrews Paper House of York, 3.56 cents; Enterprise Paper Company, 3.5 cents less 2 per cent; Paper Corp. of U. S., 3.5 cents; Mathers-Lamm Paper Company, 3.63 cents; Stanford Paper Company, 5 cents; R. P. Andrews Paper Company, 3.67 cents; Barton, Duer & Koch Paper Company, 4.17 cents; Old Dominion Paper Company, 3.654 cents; Perkins Goodwin Company, 3.49 cents; Whitaker Paper Company, 3.43 cents; Mudge Paper Company, 3.475 cents; and Graham Paper Company, 3.75 cents.

For 8,000 sheets of 24 x 32 red pressboard; Mathers-Lamm Paper Company, $65.30 per M sheets; Barton, Duer & Koch Paper Company, $63.10; Walker, Goulard Plehn Company, $63.95; Whitaker Paper Company, $63.40; and Andrews Paper House of York, $61.425.

For 23,625 pounds (250,000 sheets) of 25 per cent rag, 34 x 40, blue bond paper; Walker, Goulard Plehn Company, 9.35 cents; Graham Paper Company, 10.75 cents; Virginia Paper Company, 9.39 cents; Mudge Paper Company, 9.24 cents; Whitaker Paper Company, 9.296 cents; R. P. Andrews Paper Company, 10.75 cents; Aetna Paper Company, 9.178 cents; Barton, Duer & Koch Paper Company, 9.8 cents.

For 16,000 pounds (100,000 sheets) of 25 per cent rag, 19 x 24 white blotting paper; R. P. Andrews Paper Company, 6 cents; Graham Paper Company, 5.85 cents; Stanford Paper Company, 5.85 cents; Mathers-Lamm Paper Company, 6.64 cents; Cauthorne Paper Company, 6.34 cents; L. Hyman & Sons, 5.8 cents; and Whitaker Paper Company, 5.97 cents.

For 8,150 pounds (100,000 sheets) 25 per cent rag, 28 x 45 yellow bond paper; Graham Paper Company, 8.92 cents; Barton, Duer & Koch Paper Company, 9.7 cents; R. P. Andrews Paper Company, and balls, and carnival events of all kinds reigned 8.58 cents; Stanford Paper Company, 27 cents; Whitaker Paper Company, 8.27 cents; Mudge Paper Company, 8.16 cents; Aetna Paper Company, 8.09 cents; and Walker, Goulard Plehn Company, 8.19 cents.

For 93,500 pounds (1,000,000 sheets) of 25 per cent rag, 32 x 42 white bond paper; Graham Paper Company, 9.97 cents; Barton, Duer & Koch Paper Company, 9.4 cents; R. P. Andrews Paper Company, 9.39 cents; Stanford Paper Company, 9.11 cents; Whitaker Paper Company, 9.02 cents; Mudge Paper Company, 8.92 cents; Aetna Paper Company, 8.918 cents; and Walker, Goulard Plehn Company, 8.989 cents.

Progress in Southeastern Area

Considering the Southeastern area to be comprised of the ten Southern States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Texas, the operation of slash pine and hard wood pulp plants according to D. G. Moore, Consulting Engineer, Savannah, Ga., have developed as follows:

In 1935 there were 31 mills with a total productive capacity of 4,040 daily tons and by 1938 this capacity had been increased by 13 additional mills bringing the present day daily capacity to 7,612 tons, and representing a new investment of over $100,000,000.

During 1938 six of these new mills were fully completed representing 1,927 daily tons of pulp capacity.

Consumption of paper throughout the United States has been increasing steadily each year at the rate of approximately 1,000 daily tons and the wood pulp that goes into the manufacture of these papers now totals approximately 45,000 daily tons of which 8,000 tons is imported. When considering therefore such factors as the normal increase in consumption, tendency to offset imports and replacement of capacity due to obsolescence in older mills, the Southern expansion was fully warranted. The sudden addition of productive capacity in the South in the last year or so undoubtedly required some slight readjustment within the industry, particularly in the early months of 1938. The close of the year however, finds practically all of these mills operating at full capacity.

The South is now taking a prominent place in the pulp and paper industry and in 1939 a Festival to commemorate paper will be held in the City of Savannah, Ga., on April 17-18-19, 1939. The motive of the Southern Paper Festival is to advance the use of paper products, to educate the public in their importance and manufacturing significance, as well as create a general feeling of optimism and good will through entertaining features.

The Southern Paper Festival is being sponsored by the executives of the Southern States, the manufacturers of pulp, paper and allied industries, and a program of considerable magnitude is being arranged to include industrial exhibitions showing every class of paper and fibrous products made, the equipment used in their manufacture, with educational features tending to improve forest conservation and forest crops.

For lighter form of entertainment there will be historical pageants featuring the history of paper. Parades of decorated floats representing the states and the cellulose age, formal and informal banquets over by the King and Queen of Papyrus.

Newsprint Inquiry Still Pending

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 7, 1938—In its annual report just made public, the Federal Trade Commission speaks of the newsprint paper inquiry which was pending at the close of the fiscal year June 30, 1938 and which is being made by the Commission in response to a request from the Attorney General.

The Commission was asked "to investigate the manner in which certain newsprint manufacturers have complied with a consent decree entered against them on November 26, 1917, by the United States District Court for the Southern District of New York, and further to determine whether there were any violations of the antitrust law by the newsprint industry that were not prohibited by the decree."

In commenting on this case, the Commission in its reports says: "The defendants to the suit in connection with which the decree was entered were 7 individuals active in the management of the Newsprint Manufacturers' Association and 45 corporate defendants, including 31 American and 14 Canadian companies. The decree ordered the dissolution of the association and enjoined the defendants from violation of the antitrust laws through such practices as the fixing of prices, division of territory, and limitation of production.

"The Attorney General's request came as a result of complaints from newspaper publishers alleging that increases in the price of newsprint paper late in 1937 were the result of price-fixing activities of newspaper manufacturers."

The investigation of this subject was not only still pending at the close of the fiscal year, but latest reports indicate that the results of the investigation have not yet been transmitted to the Attorney General.

KVP Opens Experimental Branch

What Jacob Kindleberger has called Vegetable Parchment Company's first "service station" has been opened in Houston, Tex., a sort of experimental branch in which some finishing processes, such as printing and waxing, will be carried on. Some specialties which are in demand largely in the Texas territory will also be made there. Stock for finishing will be shipped from the local plant.

It is expected the Houston plant will offer an opportunity for saving on freight on the specialty items, and the management thought it wise to manufacture completely these specialties near the territory where they will be consumed.

The service station idea is applicable from the standpoint that customers can be taken care of on short notice. The manager of the Houston plant is R. H. Hughes, who has been handling the KVP line in the Texas territory for the last 14 years.

A building formerly used as a warehouse by the Missouri, Kansas, and Texas railroad, usually known as the Katy, was acquired and with some alteration adapted to its new use.

The plant is incorporated for $50,000, and its office and directors are Jacob Kindleberger, chairman of the board; Ralph A. Hayward, president; R. H. Hughes, vice president and assistant treasurer; T. W. Peck, secretary; Charles S. Campbell, treasurer, and Humberto Campos, assistant secretary.

Delaware Valley Paper Shippers Meet

The annual meeting of the Delaware Valley Paper Shippers Association was held on Monday, November 28, at the Philadelphia Hotel, Philadelphia. The meeting was presided over by Chairman Bustraan and had the best turnout since the organization of the Association. Many important matters were discussed, the majority of which were placed on the calendar for the January meeting indicating a very active program for the coming year. The thirty second member was admitted with several prospects lined up for the near future.

The election of officers resulted as follows:—Chairman, Daniel Bustraan, Paterson Parchment Paper Company; Vice Chairman, William A. Mercurio, Riegel Paper Corporation; Secretary-Treasurer, John A. Butterworth, W. C. Hamilton & Sons; Members of Executive Committee, William Butler, Glassine Paper Company; John A. Stevens, Thos. M. Royal & Co.; Ralph Thomas, Dill & Collins, Inc.

The second annual dinner of the association followed in the Pennsylvania Room, approximately 125 members and guests attending. Included among the guests were representatives of many of the eastern railroads, steamship lines, truckmen and forwarders.

Mr. Butterworth presented to Mr. Bustraan an electric desk clock as a token of appreciation from the members for the fine work done during the year.

Mr. Bustraan talked briefly on the wonderful progress of the association which he attributed to the splendid spirit of cooperation among the members. He complimented the member mills on the good work done in handling the loading of hundreds of cars to date and the various committees for the proper fulfillment of their duties. To the shipping men he pointed out the importance of maintaining their schedules and service that mean so much to the progress of the association.

Door prizes were distributed to the holders of the three lucky tickets.

A snappy floor show completed the program.

Press Visit New Clifton Mill

Newspaper and magazine representatives were guest visitors of the new Clifton Paper Board Company mill, located at Clifton, N. J., Friday, December 2. The Austin Company, builders of the plant, arranged for the inspection.

The new structure, completed after nearly two years of work, has a capacity of 250 tons a day and was specially designed to permit production of a wide range of paper boards for corrugating, shipping containers and set-up or folding boxes. It brings the combined capacity of three mills now owned by Frank Desiderio and his seven sons to 150,000 tons of paper board a year.

Mr. Desiderio came to this country from Italy in 1904 and began in the waste-paper business with a pushcart. He advanced to a horse and wagon, then to an autocar and by successive stages to ownership of the three plants, using 90,000 tons of waste paper annually. The Desiderio family was engaged exclusively in the waste-paper and trucking business until 1932, when it acquired the Clifton Paper Mills, Inc. Later it bought a mill at Whippany, N. J., from the United Paper Board Company and another at Durham, Pa., from the Sanitary Paper Products Company.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Chicago, Ill.—The Schwarz Paper Company, 1430 South Canal street, manufacturer of paper specialties, has approved plans for alterations and improvements in plant. General contract has been awarded to William E. Salomon & Company, 175 West Jackson boulevard, and work will be placed under way at once. No estimate of cost has been announced. James D. Eppenstein, 35 East Wacker drive, is architect.

Wheelwright, Mass.—The San-Nap-Pak Manufacturing Company, Inc., manufacturer of tissue papers, etc., plans early rebuilding of portion of mill recently damaged by fire, with loss reported at close to $45,000, including equipment.

Oakland, Cal.—National Automotive Fibres, Inc., Railroad avenue and Kennedy street, manufacturer of fiber products for automobile service, has concluded arrangements with RFC for a loan of $1,500,000, of which about $75,000 will be used for new machinery for Oakland plant and branch mill at Los Angeles, and a portion for working capital, remainder to be employed for general financing.

New Haven, Conn.—The New Haven Pulp and Board Company, East street, manufacturer of paper board specialties, has work under way on extensions and improvements in one of the buildings at plant, for which general contract was recently let to the H. Wales Lines Company, Meriden, Conn., as previously noted in these columns. The program will be pushed to early completion.

Detroit, Mich.—The Hinde & Dauch Paper Company, Decatur street, Sandusky, Ohio, manufacturer of corrugated boxes and containers, is said to be arranging to place erection contract at once for new branch plant at West Chicago avenue and Pennsylvania Railroad, Detroit, recently referred to in these columns, and will have superstructure in progress on main one-story unit, 200 x 510 feet, early next year. The plant is estimated to cost about $500,000, with machinery, instead of a smaller sum, previously noted, and will specialize in part in corrugated containers for the automotive industry.

South Kearny, N. J.—The Insulite Company, Builders' Exchange Building, Minneapolis, Minn., manufacturer of insulating and building board products, with main mill at International Falls, Minn., has concluded arrangements for lease of property at the Tompkins Terminal, Jacobus avenue and Lincoln highway, South Kearny, totaling about 40,000 square feet of floor space, and will occupy for new Eastern factory branch, storage and distributing plant. Company will take over property at once and install complete operating facilities. It is a subsidiary of the Minnesota & Ontario Paper Company, which operates the insulite mill at International Falls in conjunction with paper mill at that place. E. H. Batchelder, Jr., is senior vice-president of Insulite Company.

Philadelphia, Pa.—Murray Brenner, New York, N. Y., has purchased a four-story industrial building at Tulip and Palmer Streets, N. E., totaling about 25,000 square feet of floor space, and will occupy for new plant for the manufacture of paper specialties, with portion of space to be used for storage and distributing service. The structure is part of the plant of the A. J. Reach Company. Immediate possession will be taken and equipment installed.

Detroit, Mich.—The Detroit Paper Products Corporation, 5800 Domine street, manufacturer of paper boxes and containers, etc., is increasing production facilities at local plant, as well as branch plant at Kalamazoo, Mich., and will develop larger output of corrugated paper containers, as well as insulating products. The company has recently perfected a new type of corrugated shipping container and will provide for large capacity of this specialty. C. Stanley Sale is president; Walter B. Hadley is production manager.

Batavia, N. Y.—The E. N. Rowell Company, Inc., Jefferson avenue, manufacturer of paper boxes and containers, has begun work on new addition to plant, recently referred to in these columns, and will push the structure to early completion. It will be one-story, estimated to cost approximately $45,000, including equipment. M. E. Colle, LeRoy, N. Y., has the general erection contract.

Boston, Mass.—Malone Brothers Company, 16 Garfield avenue, wrapping papers, paper bags, etc., is considering early rebuilding of portions of storage and distributing warehouse on Revere parkway, Chelsea, recently destroyed by fire, with loss estimated at close to $30,000, including building, equipment and stock.

St. Pauls, Minn.—The Minnesota Mining and Manufacturing Company, Forest and Fauquier streets, manufacturer of sandpaper and other abrasive paper stocks and materials, has superstructure under way for new four-story and basement addition to mill, to replace present mill building No. 1, and provide for large increase in production facilities. It is estimated to cost about $250,000, with

equipment, and is scheduled to be ready for machinery installation early in 1939. William M. Murphy & Son, New York Building, St. Paul, are general contractors. Toltz, King & Day, Inc., Pioneer Building, city, is architect and engineer. William L. McKnight is president.

Middletown, Ohio—The Interstate Folding Box Company, Liberty avenue, manufacturer of folding and other paper boxes and containers, is proceeding with erection of new manufacturing building, previously referred to in these columns, and has awarded contract to different features of construction to Edward A. McCarthy & Son, 1212 Race street, Cincinnati, Ohio. Also an award has been made to B. & J. Jacobs Company, 1729 John street, Cincinnati, for heating, ventilating and installation of an air-conditioning system. New structure will be of thoroughly modern type, one- and two-story, totaling about 28,000 square feet of floor space, and will be equipped for large capacity. It is scheduled for completion early next year, and is estimated to cost close to $80,000, with machinery. Samuel Bergstein is president.

New York, N. Y.—The Park-Sunshine Folding Box Company, Inc., 405 East Fourth street, folding boxes and containers, has leased space in the building at 707 Broadway and will occupy for company headquarters, sales, storage and distribution. Company will remove from first noted location, providing increased facilities at new place.

Painesville, Ohio—The Industrial Rayon Corporation, Walford avenue and East Ninety-eighth street, Cleveland, Ohio, manufacturer of viscose rayon products, is beginning production at new mill at Painesville, in course of erection for a number of months past, and will step up output to a high schedule as soon as entire plant is completed. It consists of a group of one- and multi-story buildings, approximating about 14 acres of floor space, and will be equipped for a rated output of 12,000,000 pounds per annum. The plant will represent a total investment of $11,500,000, and includes power house, pumping station and auxiliary operating structures. It is expected to be fully completed early in 1939. The Hunkey-Conkey Construction Company, 1740 East Twelfth street, Cleveland, general contractor, has carried out the erection. Wilbur Watson & Associates, 4614 Prospect avenue, Cleveland, are consulting engineers, in charge. Hiram S. Rivitz is president of company.

New York, N. Y.—The National Gypsum Company, 190 Delaware avenue, Buffalo, N. Y., manufacturer of wall board and other kindred products, has preliminary plans under way for expansion and improvements in branch mill at East 150th street and East River, New York, consisting of several one-story additions, with installation of equipment for considerable increase in present capacity. It is understood that work will be carried out early next year. Cost estimated in excess of $500,000, with equipment. Company engineering department, first noted address, D. F. Hunt, chief engineer, is in charge. G. H. Tarbell is vice-president and production manager.

Menominee, Mich.—The Hoskin Paper Company, manufacturer of kraft and kindred paper stocks, has work in progress on new filter plant building, previously referred to in these columns, and will place orders soon for various equipment to be installed, including a water pump and accessories, unit heaters, etc. Filter equipment is being furnished by the Norwood Engineering Company, Florence, Mass. New addition is reported to cost close to $40,000, with equipment. L. A. DeGuere, Wisconsin Rapids, Wis., is consulting engineer.

Ste. Genevieve, Que.—The Cartier Waxed Paper Products, Ltd., manufacturer of waxed and other processed paper stocks, will begin superstructure soon for new one-story mill on local site, recently selected, and will have plant ready for equipment installation early next year. It is reported to cost approximately $60,000, including machinery.

Newton, Mass.—The G. & S. Paper Company, 93 West street, General paper products, is having revised plans prepared for new building on Watertown street, recently referred to in these columns, and will ask bids on general erection contract at early date. It will be one-story and basement, 74 x 171 feet, and will be used for storage and distributing service, and company headquarters. It is reported to cost over $50,000, with equipment. C. S. J. White, 199 Harvard circle, Newton, is architect.

New Companies

Chicago, Ill.—Kabelac Processes, Inc., 1622 Monadnock Block, has been incorporated with capital of 100 shares of stock, to manufacture and deal in paper pulp products. The incorporators are T. B. Kabelac, H. J. Spielman and C. J. Heinzelman. Alfred W. Craven, 140 South Dearborn street, is attorney and company representative.

New York, N. Y.—Roll Labels and Tickets, Inc., has been organized with capital of 100 shares of stock, no par value, to manufacture paper labels and kindred paper goods. New company is represented by Bloom & Scherl, 19 West Forty-fourth street, New York, attorneys.

Springfield, Mass.—B.B.W. Paper Company, 168 Bridge street, has filed notice of organization to deal in paper products of various kinds. Bernard R. Burns, 382 Chestnut street, is company head.

Chicago, Ill.—Paper Engineers, Inc., 38 South Dearborn street, has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in paper products, inventions for paper production, etc. The incorporators include J. L. McManus, M. A. Neidorf and J. W. Cox.

Boston, Mass.—Worley Decal Company, 166 Terrace street, Roxbury, has been organized with capital of 100 shares of stock to manufacture and deal in decalcomania transfers and kindred paper goods. William G. LeBow is president, and Russell Halliday, treasurer.

Chicago, Ill.—R. & G. Label Corporation, 325 West Ohio street, has been organized with capital of $5,000, to manufacture and deal in paper labels and kindred paper goods. New company will take over and succeed to the concern of same name, operating plant at location noted. The incorporators include S. Manchik and C. Duffy.

New Britain, Conn.—The Commercial Paper Company, 69 Lafayette street, recently chartered with capitalization of $50,000, to deal in paper products of various kinds, has filed notice of company organization, to operate with an initial paid-in capital of $20,000. Itzel Rosenblatt is president, and Maurice Gordon, treasurer.

PAPER TRADE JOURNAL

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COMING EVENTS IN THE PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park American Hotel, Kalamazoo, Mich.

STATE OF BUSINESS

Business activity continued to rise during the past month and while some setbacks have occurred since the upturn in this year which began the first week in June, the index of general business activity has advanced from a low of around 75 per cent to about 92½ per cent for the last week in November. Whether the uptrend is likely to continue is not clear from the current comment of economists, although it has been pointed out that the improvement which has continued for nearly six months should have produced sufficient cumulative effects to provide for further improvement.

According to the opinion expressed in the *Washington Review* issued by the Chamber of Commerce of the United States, "A rate of improvement such as was maintained during the last month should be sufficient in six more months, if steadily held, to return the country to the level of production and distribution which was reached in the spring of 1937 and from which there began the relapse that became precipitate in the autumn of last year. In itself, that was not a level of recovery, but it was the nearest approach the country had had, and it will be an achievement worth attaining to get back to it again, even after an interval of two years."

Business sentiment is conservative, states *The Guaranty Survey*, issued by the Guaranty Trust Company of New York, which states in part: "The prevailing spirit of caution has been reflected in security markets, where prices have moved generally downward in the last two weeks, and to some extent also in commodity markets, which have been characterized by stability rather than by buoyancy which often accompanies a business advance as vigorous as that of the last two months. The failure of business sentiment to respond wholeheartedly to the favorable course of trade is probably due to the persistence of several factors that have clouded the outlook in recent years and that will continue to give rise to serious uncertainty as long as they remain present. It is not forgotten that the business advance, particularly in certain lines, rests in part upon lavish expenditure of public funds, and that, in so far as this is the case, the upward movement is likely to continue only as long as the spending goes on. The price that is being paid for this temporary stimulation is a huge Treasury deficit bringing a series of new high records in the public debt and an assurance of higher taxes in the future."

The allure of Government spending in an attempt to increase the national income is evidently too attractive for any influencial member of the Administration to resist, although it is reasonably clear that one of the obstacles to a more complete recovery at the moment is the lack of private funds going into productive use. If the policy of the Administration was more practical and productive and less experimental, this second attempt to prime the pump would not have been necessary. But as government spending goes on and the Treasury gets deeper and deeper in red ink, and hampering laws are enacted to impede business operations, the confidence of business men must of necessity wane. While emphasis should be placed where it properly belongs on production of goods, which is the cause of prosperity, rather than on national income which is merely the effect of productive effort, too much attention is given to increasing the national income by other devices than productive means.

The report of the Treasury on November 28 showed that the Government is going into the red twice as fast as in the last fiscal year. The net deficit figures reveal that the average spending beyond income each month since this fiscal year began has been almost $330,000,000, compared with an excell of spending over receipts of about $170,000,000 per month one year ago. As the Federal Government will this week carry out its December quarterly financing, the Treasury Department announced plans to issue $700,000,000 new securities for cash, which will bring the nation's funded debt to a new peak of approximately $39,000,000,000.

Spending for prosperity should be continued, in the opinion of Marriner S. Eccles, chairman of the Federal Reserve Board, who spoke at the annual din-

ner of the Bankers Forum held in New York on November 30. Mr. Eccles asserted that a balanced budget must wait for an increased national income from maximum production and employment, which itself would balance the budget through the increased tax returns it would make available. The speaker admitted that the Roosevelt Administration, as well as the Hoover Administration before it, had failed to "mobilize the forces of distribution that would enable us to utilize the productive facilities of the nation. That means our problems are economic, not political." A great many business men will doubtless agree that the economic state of the nation is largely the result of the political state; that politicians have passed drastic laws which have had a drastic effect upon industry and trade and employment and that thusly the confused economic situation is mainly due to the confused thinking of politicians.

Mr. Eccles urged that a broader view be taken of taxation and stated that if our annual national income averaged 88 billions of dollars, which would be comparable with Great Britain's on a percentage basis, considering that the British figure has averaged 110 per cent of the 1929 level, whereas ours has averaged only 75 per cent for the past three years, and if our total tax ratio were 20 per cent as in Great Britain, compared to 17½ per cent for all Federal, State and local taxes in this country, "we would be collecting nearly $18,000,000,000 a year in taxes, which would be between seven and eight billions more than we are collecting now." But, "if" is a word used by Mr. Eccles in a contingent sense, denoting a wish, and there is no factual base to rest a reasonable expectation upon.

In urging banking support of policies designed to bring forth maximum production and emplyoment, Mr. Eccles said in part: "We must learn to distinguish clearly between measures that encourage and those that discourage private activity, private investment and risk-taking, for manifestly only as private activity thrives can the government's burden of caring for those in economic distress be reduced. . . . We must better understand the bad effects of unbalanced price conditions, whether resulting from ill-advised price, wage and hour policies of labor and industry, or from other causes, such as a failure to sustain agricultural income. We must recognize that taxation policy should be closely integrated with monetary and fiscal policy—that taxation is not a separate matter concerned only with the raising of revenue, but that the type, the timing and the effect of taxation upon the stimulation of private enterprise or upon the restraint if a speculative boom threatens must be considered.

"In other words, it seems to me that we may well consider the influence that tax policy may have in contributing to a well balanced relationship between consumer buying power on the one hand and savings and investment on the other hand. Such a balance is essential to maintain reasonably full employment which, in turn, is necessary for the protection of existing values of loans, investments and other forms of capital, and also to provide further opportunities for profitable investment of new savings."

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.9%	90.3%	76.1%	65.8%	.....
February	68.7%	90.1%	77.9%	70.0%	.....
March	69.6%	90.3%	76.0%	70.5%	.....
April	68.3%	92.1%	82.3%	70.0%	.....
May	69.0%	90.6%	81.6%	69.4%	.....
June	66.0%	87.3%	80.7%	72.3%	.....
July	72.0%	81.8%	77.3%	64.9%	.....
August	77.2%	82.9%	81.5%	70.9%	.....
September	76.3%	78.6%	80.5%	71.9%	58.2%
October	82.5%	73.5%	86.6%	75.6%	64.7%
November	.....	61.9%	88.0%	75.3%	61.7%
December	.....	54.5%	85.9%	71.2%	59.6%
Year Average	.....	80.6%	81.3%	70.5%	.....
First 47 weeks	71.9%	83.5%	80.9%	70.4%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS. 1938		CORRESPONDING WEEKS. 1937	
October 22	83.8%	October 23	73.6%
October 29	81.8%	October 30	68.8%
*November 5	82.6%	November 6	65.3%
*November 12	80.7%	November 13	61.7%
*November 19	81.9%	November 20	62.5%
*November 26	71.2%	November 27	58.0%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: Oct. 22, 1938	Oct. 29, 1938	Nov. 5, 1938	Nov. 12, 1938	Nov. 19, 1938	Nov. 26, 1938
0% to 50%	60	56	63	74	58	71
51% to 100%	248	252	243	229	235	146
Total Mills Reporting	308	308	306	303	293	217

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

Paperboard Operating Ratios

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Mos.	1938 (e)	1937 (e)	1936	1935	Mos.	1938 (e)	1937 (e)	1936	1935
Jan.	55%	80%	61%	61%	July	57%	67%	69%	59%
Feb.	61%	86%	67%	67%	Aug.	66%	74%	75%	65%
Mar.	60%	87%	68%	67%	Sept.	66%	70%	76%	69%
Apr.	57%	89%	70%	61%	Oct.	70%	66%	82%	76%
May	58%	86%	68%	61%	Nov.	.....	56%	79%	70%
June	56%	75%	68%	65%	Dec.	.....	46%	74%	60%

Week end. Oct. 22, 1938—70%
Week end. Oct. 29, 1938—69%
Week end. Nov. 5, 1938—68%
Week end. Nov. 12, 1938—66%
Week end. Nov. 19, 1938—67%
Week end. Nov. 26, 1938—57%

(e) Basic figures revised to include new members of the National Paperboard Assn.

Island Paper Mill Dismantled

[FROM OUR REGULAR CORRESPONDENT]

MENASHA, Wis.—Machinery in the former Island Paper Company strawboard mill is being dismantled, and the buildings have been offered for sale. The mill was purchased sometime ago by the Wade Paper Company of Ohio. If no buyer is found for the buildings, it is reported they will be razed. The mill had two Fourdriniers of 63 and 74-inch width, and a capacity of 30 tons per day. It has been idle for some time.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

A Survey of the American Literature in the Field of Cellulose and Related Subjects for 1933 Through 1937

By Harry F. Lewis [1]

(Continued from the issue of November 24, 1938)

Alkaline Cooking

Aronovsky *(173)* gives a resumé of the research carried on by Gortner and himself in the field of the alkaline cooking process as well as in the cooking of wood with salts. In this article, he describes the cooking by water and by aqueous solutions of sodium carbonate and sodium sulphate, sodium bromide, sodium thiosulphate, sodium sulphite, sodium sulphide, sodium hydroxide, and trisodium phosphate. These various solutions were used one at a time as cooking agents, and in the article Aronovsky reveals the main components of the residual wood and the liquors obtained. Aronovsky and Gortner *(174)* have cooked aspen with sodium carbonate and have recovered the volatile organic acids from the black liquor. They find these to vary between 4.6 and 7.0 per cent on the weight of oven-dried wood, calculated as acetic acid. A decreasing concentration of the sodium carbonate results in a slight decrease in the yield of the volatile acids, while variation in the wood to water ratio within the limit given had no appreciable effect. The production of volatile organic acids from wood in these experiments is therefore attributed to saponification. Only acetic and formic acids were present in the distillate, the ratio of formic to acetic acid varying between 1 to 5.9 and 1 to 9.4. Nolan and MacCready *(175)* give experimental data on the rate of digestion of wood by sodium hydroxide. An empirical method for predicting the rate and extent of the pulping reaction has been developed from the data and checked against figures reported by other investigators with a surprisingly good agreement.

Three papers have appeared from the Forest Products Laboratory. The first by Bray and Curran *(176)* takes up the influence of chemical concentration in the alkaline pulping process. The effect of an increase in the concentration of chemicals is to increase the rate of delignification and also the rate of decomposition of the cellulose and alpha-cellulose. Decreasing the concentration of the cooking chemical had a beneficial effect in increasing the yield of screened pulp. For the production of bleachable kraft pulp, where an excess of chemical is necessary, low concentration of chemical in the cooking solution is beneficial as regards conservation of strength and bleaching agent. Martin, Bray, and Curran *(177)* have been unable to find an optimum or critical temperature for kraft pulping within the range of commercial practice. The properties and kraft pulping of compression wood have been investigated by Pillow and Bray *(178)*. A lower yield of crude pulp is obtained from compression wood; the pulp shows a decrease in strength properties and chemical purity and a marked increase in bleach requirement. Hence, compression wood requires more drastic cooking than ordinary wood.

Davis *(179)* has developed a process of soda cooking and bleaching, consisting of alkaline digestion with a low percentage and concentration of alkali followed by a first stage chlorination, an alkaline wash, and a final hypochlorite bleach. Very satisfactory yields of pulp are thus obtained from aspen wood.

The influence of sulphidity of the cooking liquor on the physical and chemical characteristics of kraft pulp has been the subject of an investigation by Kress and McGregor *(180)*. Under the conditions investigated the authors conclude that the ratio of caustic to sulphide is restricted to fairly narrow limits if a maximum yield of an acceptable pulp possessing good physical characteristics is desired.

The elimination of obnoxious gases in the sulphate pulping process has been investigated by Gordon

(173) Aronovsky, S. I., *Paper Ind.* 16, No. 6: 413-19 (Sept., 1934).
(174) Aronovsky, S. I., and Gortner, R. A., *Ind. Eng. Chem.* 27, No. 4: 451-54 (April, 1935).
(175) Nolan, W. J., and MacCready, D. W., *Paper Trade J.* 102, No. 4: 36-42 (Jan. 23, 1936).
(176) Bray, M. W., and Curran, C. E., *Paper Trade J.* 97, No. 5: 30-35 (Aug. 3, 1933).
(177) Martin, J. S., Bray, M. W., and Curran, C. E., *Paper Trade J.* 97, No. 20: 38-42 (Nov. 16, 1933).
(178) Pillow, M. Y., and Bray, M. W., *Paper Trade J.* 101, No. 26: 31-4 (Dec. 26, 1935).
(179) Davis, R. L., *Paper Trade J.* 97, No. 24: 33-46 (Aug. 24, 1933).
(180) Kress, O., and McGregor, G. H., *Paper Trade J.* 96, No. 24: 40-42 (June 15, 1933).

[1] Member TAPPI, Dean, The Institute of Paper Chemistry, Appleton, Wis.

and Creitz *(181)*. They find that mercaptan and alkyl sulphides can be removed from the non-condensable gases present in the relief gases from a kraft digester by spraying into the gases a solution of hypochlorite. It is believed impractical to destroy all the mercaptans by the chlorine treatment and other means are suggested.

Kress and Williams *(182)* pass sulphur dioxide into kraft lime mud at such a rate as to produce bisulphite cooking liquor of a normal strength. They use sawdust to filter the liquor. Pulp produced from this sulphite liquor compares favorably with pulp from regular sulphite liquor.

Kress and Harrison *(183)* have cooked kraft pulp with liquors to which calcium carbonate or clay had been added to simulate improperly settled white liquors. The pulp from such cooks show a loss in strength, having an undesirable gray color and resemble pulps made in the mill from improperly settled white liquor. The undesirable characteristics of the pulp are due to the presence of mechanically entrained calcium carbonate, which may be removed from the pulp by improved washing. Kress and McIntyre *(184)* have made a sulphur balance of a kraft cook. In the same report they compare the methods used for the determination of sulphide in black liquor. Holzer *(185)* has identified the coloring matter in certain kraft pulps as a sulphur derivative of phlobatannin.

Groundwood Pulp

One of the developments of the last few years which is of very great interest in the field of groundwood has been the production of newsprint from Georgia slash pine by Herty *(186) (187)*. Additional work from the same laboratory is reported by McNaughton and Allen *(188)*, by Rommel *(189)*, and by Walker *(190)*. The last article describes the grinding of southern pine under semi-commercial conditions from the average run of young loblolly, long leaf, and slash pine, using stones which were considered suitable for the purpose. The results point to the desirability of investigating factors of stone structure developed especially for use with southern pine.

The very comprehensive work on the variables in the manufacture of groundwood being carried on at the Forest Products Laboratory has resulted in the publishing of a number of excellent papers. The strength and suspension properties of groundwood pulp in relation to the dimension of the fibers have been studied by Schaefer and Santaholma *(191)*. From their data, they conclude that screen analysis can be used as an aid in evaluating pulp quality. The same investigators *(192)* have separated the various screen fractions of black gum and slash pine groundwood pulps. Chemical analyses indicate that lignin varies from fraction to fraction and is high in the fine fractions. Solubility in one per cent NaOH is also higher for the fine fractions. The chemical components in the various fractions appear to have little bearing on the paper making qualities of the pulp. Schaefer and Pew *(193)* have ground white spruce and loblolly pine at various temperatures and consistencies under controlled conditions. In general, grinding is favored at higher temperatures provided excessive pulp consistencies are prevented by the use of warm shower water. The use of a high temperature results in an increase in grinding rate, a decrease in power consumption, an increase in pulp strength, and a material increase in fiber length and freeness. At the consistencies used, the temperatures had little effect on pulp color. An extension of this work has been reported by Schaefer, Pew, and Knechtges *(194)*.

Curran, Schaefer, and Pew *(195)* find that the color in western hemlock is caused by reddish inclusions in the ray cells. The material is probably of tannin nature. The fine fibered portion from western hemlock groundwood contains more than the coarse fibered portion which indicates that these cells are highly disintegrated in the grinding process. Such pulp is improved in color by treatment with bisulphite and the hydrosulphites. Alkaline peroxide is an excellent bleaching agent.

Bleaching

A number of papers on the characteristics of the three important bleach chemicals, namely, water, chlorine, and lime, have appeared. The first by Hamilton *(196)* deals with desirable and undesirable features in the water supply. The particular properties of chlorine which relate to its use in bleaching are described by Elledge *(197)*, while Cook *(198)* discusses the specifications of lime.

The determination of available chlorine in hypochlorite solutions has been studied by Willson *(199)* and by Jackson and Parsons *(200)*. The first method recommended is the direct titration with sodium thiosulphate, whereby this reagent in dilute acetic acid is completely oxidized by hypochlorite to sulphate, eight equivalents of chlorine being used per mole of thiosulphate. Jackson and Parsons have modified the method of Pontius to include an inside indicator, thus using only a single reagent. Good agreement is obtained with the arsenite method.

John and Poppe *(201)* describes an accurate alkaline bleach demand test for sulphite—suitable for mill, laboratory, or research purposes—which completely eliminates the human element in grading and judging pulps, colors, or solution end points.

Eastwood *(202)* has used this bleachability test to good advantage in determining the degree of cooking in experimental sulphite pulping studies. The relationship between pulp yield and bleachability, as well

(181) Gordon, W. O., and Creitz, E. E., *Ind. Eng. Chem.* 26, No. 5: 565-67 (May, 1934).
(182) Kress, O., and Williams, E. H., *Paper Trade J.* 104, No. 20: 50-51 (May 20, 1937).
(183) Kress, O., and Harrison, W. D., *Paper Trade J.* 100, No. 22: 30-34 (May 30, 1935).
(184) Kress, O., and McIntyre, J. W., *Paper Trade J.* 100, No. 18: 43-46 (May 2, 1935).
(185) Holzer, W. F., *Paper Trade J.* 99, No. 12: 91-103 (Sept. 20, 1934).
(186) Herty, C. H., *Paper Trade J.* 96, No. 13: 23-27 (March 30, 1933).
(187) Herty, C. H., *Paper Mill* 56, No. 38: 10-14 (Sept. 23, 1933).
(188) McNaughton, W. G., and Allen, W. F., *Paper Trade J.* 97, No. 2: 36-40 (July 13, 1933).
(189) Rommel, G. M., *Chem. Met. Eng.* 40, No. 4: 197-200 (April, 1933).
(190) Walker, W. J., *Paper Trade J.* 105, No. 12: 44-54 (Sept. 16, 1937).
(191) Schaefer, E. R., and Santaholma, M., *Paper Trade J.* 97, No. 19: 40-45 (Nov. 9, 1933).
(192) Schaefer, E. R., and Santaholma, M., *Paper Trade J.* 97, No. 19: 46-47 (Nov. 9, 1933).
(193) Schaefer, E. R., and Pew, J. C., *Paper Trade J.* 101, No. 13: 71-6 (Sept. 26, 1935).
(194) Schaefer, E. R., Pew, J. C., and Knechtges, R. G., *Paper Mill* 59, No. 17: 19-22 (April 25, 1936).
(195) Curran, C. E., Schaefer, E. R., and Pew, J. C., *Pac. Pulp Paper Ind.* 9, No. 7: 10-15 (July, 1935).
(196) Hamilton, DeV., *Paper Ind.* 17, No. 11: 818-19 (Feb., 1936).
(197) Elledge, H. G., *Paper Ind.* 17, No. 11: 806-9 (Feb., 1936).
(198) Cook, O. L., *Paper Ind.* 17, No. 11: 815-17 (Feb., 1936).
(199) Willson, W. A., *Ind. Eng. Chem., Anal. Ed.* 7, No. 1: 44-45 (Jan., 1935).
(200) Jackson, D. T., and Parsons, J. L., *Paper Trade J.* 103, No. 7: 77-78 (Aug. 13, 1936).
(201) John, H., and Poppe, T. W., *Paper Trade J.* 99, No. 9: 36-37 (Aug. 30, 1934).
(202) Eastwood, P. R., *Ind. Eng. Chem.* 28, No. 9: 1038-42 (Sept., 1936).

as a few simple relationships between bleachability and two-stage bleaching, are outlined in this article. From these data, calculations concerning the most economic bleachability to which the pulp should be cooked for the production of bleached pulps are presented. Seborg *(203)* outlines a rapid method for determining directly the amount of hypochlorite necessary to bring a pulp to a selected degree of whiteness. Wiles *(204)* has presented a method which is adapted for the estimation of the relative bleachability of pulp whereby the volume of 0.1 *N* potassium permanganate solution which is absorbed by one gram of oven-dried pulp under specified conditions is determined. He claims that the method is equally easy to use for all ordinary types and grades of wood pulp and that it is readily converted into terms frequently used to denote relative hardness or bleachability, such as chlorine number, per cent bleach consumption, and other types of permanganate numbers.

General papers on bleaching include those by Rue *(205, 206)*, Hirschkind *(207)*, Henderson *(208)*, and Casciani and Heilborn *(209)*.

Under the head of the general mechanism of bleaching there should be listed the work of Brauns *(210)*, Henderson *(211)*, and Hisey and Koon *(212)*. Brauns has methylated one hydroxyl in the lignin of unbleached pulp; the resulting product reacts very little, if at all, with chlorine. This hydroxyl, therefore, controls in a large measure at least the bleach reaction between lignin and chlorine. Incidentally, the methylated pulp approaches the brightness of a bleached pulp, is relatively stable to light, and no longer gives the characteristic fiber reactions of an unbleached pulp; hence, this same hydroxyl appears to be a factor in those reactions as well. Henderson describes the formation of acid and alkali-soluble chlorolignins through a properly buffered chlorination. Hisey and Koon have presented in considerable detail the effect of *p*H of bleach solutions on the rate of chlorine consumption. The strongest pulp was obtained at *p*H 1.7, the brightest at *p*H 10.8 for the chlorination stage. The effect of a variation in *p*H during the second stage with calcium hypochlorite is also discussed.

A number of rather complete papers have appeared on the bleaching processes used with specific fibers. Sutermeister *(213)* writes concisely on the bleaching of soda fiber. Coster *(214)* describes the bleaching of western hemlock, which is a little out of the ordinary bleaching operation because of the presence of colored residues in the ray cells. Coster says these are related to the tannins. Holzer's earlier work in kraft cooking *(215)* and that of Curran, Schaefer, and Pew *(216)* on western hemlock groundwood gave the same indication. Crain *(217)* carried out a detailed study of the bleaching of rag half stock with calcium hypochlorite. Variables studied included the concentration of the hypochlorite solution, ratio of available chlorine to cellulose, time, temperature, and *p*H of bleach liquor. The most rapid degradation over a *p*H range of 4.5—10 occurs at 6.8. This is supported by data on the viscosity, the alpha-cellulose and beta-cellulose contents, copper number, and methylene blue absorption. Strength differences of high viscosity stocks cannot be developed at consistencies below 4 per cent. Kress and Voigtman *(218)* have studied the variables influencing the chlorination of Mitscherlich sulphite pulp. Milham *(219)* touches on the bleaching and deinking of waste paper pulp. Osborne *(220)* relates the bleach characteristics of unbleached hardwood sulphite with the different sulphur dioxide concentrations in the cooking. Rue *(221, 222)* and Rue and Sconce *(223)* have taken up the bleaching of kraft and the requirements for success in this process. The last named paper deals particularly with the importance of the direct chlorination stage. For bleaching to a high white, a typical operation would include: (1) chlorination, (2) chlorination, (3) caustic extraction, (4) hypochlorite, and (5) hypochlorite treatment. Thorough washing of the unbleached stock lowers the chlorine consumption and reduces the quantity of phlobatannin present.

Of interest to textile bleachers is the article by Rupp *(224)* on the use of hydrogen peroxide for bleaching cotton goods. Two stages are used, the first a caustic boil, the second the actual peroxide bleach. The more thorough the first stage, the better will be the peroxide bleach. The use of ultra-violet light to speed up rate of bleaching and improve the color, according to the method of Escourrou, has been investigated by Hirschkind, Pye, and Thompson *(225)*. The original author found that both color and rate of bleaching were improved but at a greater consumption of chlorine and a more vigorous attack on the cellulose. Hirschkind and his co-workers found that only rays shorter than 300 millimicrons degrade cellulose and that beyond 400 millimicrons the light had no appreciable effect. The optimum range is between 350 and 385 millimicrons. Kraft, soda, or sulphite pulps were prepared with chemical characteristics equal to the best commercial pulp but with considerably brighter colors.

Beating and Hydration

A comprehensive review of current theories in regard to the beating of cellulose fibers has been presented by Clark *(226)*, who has made an attempt to bring them together through a composite theory. He presents evidence to show that cellulose is subject to partial solution when wet with water, one result of which is the production of a mucilage which is active in sheet formation. Young and Rowland *(227)* continue the work on hydration at The Institute of Paper Chemistry with a paper dealing with the rela-

(203) Seborg, C. O., *Paper Trade J.* 98, No. 8: 109 (Feb. 22, 1934).
(204) Wiles, R. H., *Paper Trade J.* 98, No. 11: 34-36 (March 15, 1934).
(205) Rue, J. D., *Paper Trade J.* 101, No. 18: 87-90 (Oct. 31, 1935).
(206) Rue, J. D., *Paper Trade J.* 102, No. 23: 33-36 (June 4, 1936).
(207) Hirschkind, W., *Pac. Pulp Paper Ind.* 10, No. 4: 7-8 (April, 1936).
(208) Henderson, C. T., *Paper Trade J.* 98, No. 26: 59-62 (June 28, 1934).
(209) Casciani, T., and Heilborn, A., *Paper Ind.* 17, No. 11: 810-14 (Feb., 1936).
(210) Brauns, F. E., *Paper Trade J.* 103, No. 5: 36-39 (July 30, 1936).
(211) Henderson, C. T., *Paper Ind.* 17, No. 11: 820-21 (Feb., 1936).
(212) Hisey, W. O., and Koon, C. M., *Paper Trade J.* 103, No. 6: 36-43 (Aug. 6, 1936).
(213) Sutermeister, E., *Paper Ind.* 17, No. 11: 834-36 (Feb., 1936).
(214) Coster, N. W., *Paper Ind.* 17, No. 11: 829-31 (Feb., 1936).
(215) Holzer, W. F., *Paper Trade J.* 99, No. 12: 91-103 (Sept. 20, 1934).
(216) Curran, C. E., Schaefer, E. R., and Pew, J. C., *Pac. Pulp Paper Ind.* 9, No. 7: 10-15 (July, 1935).
(217) Crain, R. C., *Paper Trade J.* 103, No. 24: 37-46 (Dec. 10, 1936).

(218) Kress, O., and Voigtman, E. H., *Paper Trade J.* 97, No. 7: 29-44 (August 17, 1933).
(219) Milham, E. G., *Paper Ind.* 17, No. 11: 837-38 (Feb., 1936).
(220) Osborne, W. M., *Paper Ind.* 17, No. 11: 832-33 (Feb., 1936).
(221) Rue, J. D., *Paper Trade J.* 104, No. 7: 31-33, 34-37 (Feb. 18, 1937).
(222) Rue, J. D., *Paper Trade J.* 104, No. 25: 19-20 (June 24, 1937).
(223) Rue, J. D., and Sconce, J. S., *Paper Trade J.* 95, No. 17: 54-62 (Oct. 27, 1932).
(224) Rupp, R. E., *Chem. Industries* 39, No. 3: 257, 259 (Sept., 1936).
(225) Hirschkind, W., Pye, D. J., and Thompson, E. G., *Paper Trade J.* 105, No. 18: 118-19 (Oct. 28, 1937).
(226) Clark, J. d'A., *Paper Trade J.* 97, No. 26: 25 (Dec. 28, 1933).
(227) Young, G. H., and Rowland, B. W., *Paper Trade J.* 97, No. 15: 44 (Oct. 12, 1933).

tion between the pentosan content and the hydration capacity of softwood pulps. A linear relation for a number of softwood pulps is indicated. Lewis and Gilbertson *(228)* find that the temperature effect in the beating of rag stock is a matter of some importance in the strength of handsheets prepared from such stock. The physical characteristics of the hot beaten stocks are much lower than those for cold beaten stocks, although the temperature of beating causes no variation in the chemical constants. The effect of beating on fiber structure is described by Weil *(229)*, who indicated the purpose of beating as twofold; first, to bruise the various membranes and damage them in such a way that the first and subsequent layers of fibrils are loosened without harming the length of the fiber; and second, to form a structureless slime or gel which serves to cement the fibers in the dried sheet.

Pulp Properties and Pulp Testing

Lary and Davis *(230)* have determined the effect of variation between *p*H 4 to 9 on the freeness of chemical and groundwood pulps. With the chemical pulps the drainage time increases as the *p*H is increased from *p*H 4 to a maximum in the range *p*H 5 to 6, after which it decreases. With groundwood, the values above *p*H 6 are erratic; below this the drainage time increases 60 per cent in going from *p*H 4 to 4.4.

McGregor *(231)* has studied the relation between the physical characteristics of pulps and their chemical constants using two rag stocks, an alpha pulp and a Mitscherlich sulphite. These were degraded in various ways and the products tested physically and analyzed chemically. There appears to be quite a definite relation between viscosity and fold within the various types of pulps.

Morgan *(232)* compared the action of a number of milling equipments which have been proposed for the strength testing of pulps. Simmonds and Baird *(233)* have determined some of the variables in processing pulp in a pebble mill, in a rubber surfaced ball mill, and in a beater. A detailed comparative study of five different sheet machines for pulp evaluation is presented by Doughty and Curran *(234)*. Williams *(235)* describes a new, rapid pulp and paper testing outfit, and Green *(236)* outlines the defects in the design of the sheet-forming device specified by the TAPPI tentative standard T 205 m and compares this instrument to his own standard sheet mold.

Kress and Brainerd *(237)* have fractionated a series of chemical and mechanical pulps and the isolated fractions have been tested for chemical and physical properties. They conclude that chemical and physical properties grow poorer in successively shorter fractions of unbeaten chemical pulps, while the strength of mechanical pulps increases with decreasing fiber lengths. They have also investigated the effect of beating on the nature of the fractions from chemical pulps. The conclusions were that in the case of bleached pulps the resistance of pulps to cutting action appears to be related to the purity of the pulps.

Sizing

Various rosin sizing methods are surveyed by Dreshfield *(238)*. In this same magazine Rowland *(239)* summarizes the recent advances in colloid chemistry as they relate to the problem of rosin sizing. This he expands in a later article *(240)*. DeCew *(241)* discusses the various special types of rosin size, their properties and uses. Bialkowsky *(242)* has studied the rate of hydrolysis of sodium abietate at beater concentrations and finds this to be quite low in the absence of pulp, while in the presence of pulp it is much higher. The absorption of alkali and the sodium abietate hydrolysis are closely related for each pulp. Robinson *(243)* has made a detailed investigation of the system rosin-size, alum, and fiber. The study included the effect of excess aluminum sulphate solution on dilute sodium abietate solution in the absence and presence of pulp fibers, and gave a comparison of the relative ease of sizing of various pulps in relation to their behavior to sodium abietate and aluminum sulphate solutions. The losses which occur in size making have been described by Krimmel *(244)*. They have been considered from a theoretical standpoint, involving the results of analyses of raw materials and the composition of rosin soaps. Details are given of a practical method for measuring actual losses. Stevens *(245)* outlines the methods for preparing rosin from wood and the properties of the product used as a sizing agent. Cobb *(246)* reviews the theory of sizing based on the equation for flow into capillaries. This theory embraces the hypothesis that internal sizing raises the contact angle of some liquids against fiber, while surface sizing reduces the flow of liquids by closing the pores against them and may also do so by raising the contact angle against them. The dubious relationship of air porosity and moisture, grease and ink resistance, as well as swelling and pore space, are also discussed. Lee *(247)* has made microscopic studies of a number of variously prepared rosin sized papers. He concludes that in all papers rosin is irregularly distributed, and most irregularly in the most poorly sized, that rosin is typically present as discrete particles, that in the more nearly completely sized papers the particles are typically not fused, although in the more poorly sized they may be. More rosin does not necessarily result in better sizing. He believes that poor sizing may result from use of too little rosin for full protection of the fiber surfaces or from the aggregation or fusion of particles where more rosin is present. No continuous film, either coating the individual particles or filling the interstices, can be demonstrated. He furthermore believes firmly that the best sizing in the papers examined is apparently correlated

(228) Lewis, H. F., and Gilbertson, LaV. A., *Paper Trade J.* 100, No. 15: 37 (April 11, 1935).
(229) Weil, C., *Paper Ind.* 16, No. 12: 842 (March, 1935).
(230) Lary, E. C., and Davis, D. S., *Paper Ind.* 17, No. 4: 249 (1935).
(231) McGregor, G. H., *Pac. Pulp Paper Ind.* 9, No. 10: 9; No. 11: 17; No. 12: 20 (1935); *Paper Trade J.* 102, No. 11: 27 (March 12, 1936).
(232) Morgan, H. W., *Paper Trade J.* 97, No. 24: 35-38 (Dec. 14, 1933); 98, No. 15: 44-46 (April 12, 1934).
(233) Simmonds, F. A., and Baird, P. K., *Paper Trade J.* 98, No. 20: 33-42 (May 17, 1934).
(234) Doughty, R. H., and Curran, C. E., *Paper Trade J.* 97, No. 25: 38-44 (Dec. 21, 1933).
(235) Williams, T. M., *Paper Mill* 58, No. 34: 19 (Aug. 24, 1935).
(236) Green, A. B., *Paper Mill* 58, No. 36: 14-16 (Sept. 7, 1935).
(237) Kress, O., and Brainerd, F. W., *Paper Trade J.* 98, No. 13: 35-39 (March 29, 1934).
(238) Dreshfield, A. C., *Paper Maker (U. S.)* 2, No. 1: 9-12 (Jan.-Feb., 1933).
(239) Rowland, B. W., *Paper Maker (U. S.)* 2, No. 5: 85 (Sept.-Oct., 1933).
(240) Rowland, B. W., *J. Phys. Chem.* 41, No. 7: 997-1005 (Oct., 1937).
(241) DeCew, J. A., *Paper Trade J.* 100, No. 11: 44-46 (March 14, 1935).
(242) Bialkowsky, H. W., *Paper Trade J.* 97, No. 13: 29-46 (Sept. 28, 1933).
(243) Robinson, S. J., *Paper Trade J.* 103, No. 7: 104-12 (Aug. 13, 1936).
(244) Krimmel, M., *Paper Trade J.* 101, No. 1: 44-46 (July 4, 1935).
(245) Stevens, R. H., *Paper Ind.* 16, No. 4: 249 (July, 1934).
(246) Cobb, R. M., *Paper Trade J.* 100, No. 16: 42-45 (April 18, 1935).
(247) Lee, H. N., *Paper Trade J.* 103, No. 27: 32-36 (Dec. 31, 1936).

with the finest particles which, in turn, result in the most uniform distribution. A rather comprehensive review on the literature of sizing, going back to 1900 and referring to the more important works prior to that date, has been assembled by Sutermeister *(248-251)*.

Cobb, Chamberlin, and Dombrow *(252)* describe an emulsifying base which makes it possible to produce wax size emulsions in ordinary paper mill equipment. Such emulsions are characterized by unusual uniformity, extremely fine particle size, stability in hard water at all temperatures, and stability over a wide *p*H range. Ladoo *(253)* discusses the production and advantages of wax-rosin sizes as applied to paper, stating that these give better sizing with less material and at lower cost, with the absence of foaming, lower brittleness, and better resistance to penetration of alkaline and alcoholic solutions. Wax materially improves the permanence of paper and gives the product a higher gloss, better printing qualities and an apparent opacity. Kumler *(254)* presents an excellent review of the patents relating to surface sizing with wax, as well as the classification of and comments on the methods of application.

Considerable variation has been experienced in the paper industry with regard to the use of starch size, the addition of starch in some mills increasing and in others decreasing the strength of the paper made. Work was carried out, therefore, at the Forest Products Laboratories by Chilson, Simmonds, Baird, and Curran *(255)* to determine the influence of stock temperature and hydrogen-ion concentration on sheet properties of a kraft paper sized with a special starch. When the hydrogen-ion concentration of the stock at the headbox was either 4.4 or 5.5, the tearing, bursting, and tensile strengths increased. At a value of 6.5, only the bursting strength was raised. Varying the headbox temperatures from 65 to 75° F. did not affect the sizing or other qualities of the starch.

Klein and Minor *(256)* discuss the testing of animal size for fine papers. The relative merit of mill-prepared and purchased dry glues are given in tables and graphs. The average viscosity of mill-prepared glues was found to be better than that of the prepared glue samples. Indirect heating of glue storage tanks was found to improve the viscosity and gel strength of the size.

Paper Properties

Considerable attention has been paid during the years since the NRA to the matter of definition and measurement of paper characteristics. The result of this has been the accumulation of a large body of fundamental knowledge on paper characteristics and their measurements. The older instruments have been modernized and calibration methods have been refined. A general paper on the uses and limitations of what might be termed the mechanical testers has been written by Carson *(258)*.

(248) Sutermeister, E., *Paper Trade J.* 97, No. 4: 18, 21-25 (July 27, 1933).
(249) Sutermeister, E., *Paper Trade J.* 97, No. 21: 26-28, 31 (Nov. 23, 1933).
(250) Sutermeister, E., *Paper Trade J.* 97, No. 22: 20-25 (Nov. 30, 1933).
(251) Sutermeister, E., *Paper Trade J.* 98, No. 1: 25-31 (Jan. 4, 1934).
(252) Cobb, R. M., Chamberlin, D. S., and Dombrow, B. A., *Paper Trade J.* 97, No. 10: 35-38 (Sept. 7, 1933).
(253) Ladoo, R. B., *Chem. Met. Eng.* 40, No. 2: 89-90 (Feb., 1933).
(254) Kumler, R. W., *Paper Trade J.* 104, No. 10: 36-38 (March 11, 1937).
(255) Chilson, W. A., Simmonds, F. A., Baird, P. K., Curran, C. E., *Paper Trade J.* 97, No. 14: 39-43 (Oct. 5, 1933).
(256) Klein, F. S., and Minor, J. E., *Paper Ind.* 17, No. 10: 729-33 (Jan., 1936).
(258) Carson, F. T., *Paper Ind.* 16, No. 9: 621-26 (Dec., 1934); *Paper Trade J.* 101, No. 8: 31-34 (Aug. 22, 1935).

A modification of the Abrams Penescope tester using blood serum for testing the blood resistance of butcher's wrapping paper has been described by Libby and Parkinson *(259)*.

Due to the stress laid on brightness by the Central Grading Committee, a considerable amount of work has been done on the measurement of this characteristic in paper. Lewis *(260)*, Davis *(261)*, and Michaelson *(262)* describe the General Electric Reflection Meter adopted as standard. Judd *(263)* suggests an extension of MacAdams' work on yellowish-white textiles and Hunter *(264)* outlines still another method. In a later paper Judd *(265)* defines the optical specifications of light-scattering materials. The factors influencing the brightness of paper as recorded by the General Electric Reflection Meter have been investigated by Laughlin and Kress *(266)*.

Related to the characteristic of brightness is that of color. Forrest *(267)* reviews the Munsell color system and describes the device developed by Bausch and Lomb for use with this system. Hatch and Houff *(268)* describe the Razek-Mulder Color Analyzer. A method for determining whiteness is outlined by Judd *(269)*. Three instrumentation reports from The Institute of Paper Chemistry deal with the adaptability of the G. E. Reflection Meter as a color analyzer. The first *(270)* correlates results obtained using the reflection meter with those from the Hardy Color Analyzer; the second *(271)* outlines the factors influencing the accuracy of color measurements on the G. E. Reflection Meter; while the third *(272)* deals with the effect of infra-red fluorescent radiation on measurements on the reflection meter.

The measurement of sheet formation has been developed instrumentally by Davis, Roehr, and Malmstrom *(273)* and this instrument, known as the Thwing Formation Tester, has been evaluated as a part of the Instrumentation program of The Institute of Paper Chemistry *(274)*. In a second article from the Institute, the Thwing readings have been correlated with visual formation gradings by the Mead standards *(275)*.

A photo-electric device for the objective measurement of light scattered by small particles and by the surface fuzz of papers is the subject of the 19th Instrumentation Report from The Institute of Paper Chemistry *(276)*.

(259) Libby, C. E., and Parkinson, L., *Paper Trade J.* 96, No. 18: 37-40 (May 4, 1933).
(260) Lewis, L. C., *Paper Mill*, 57, No. 25: 20, 44 (June 23, 1934); *Paper Trade J.* 101, No. 6: 36-39 (Aug. 8, 1935).
(261) Davis, M. N., *Paper Trade J.* 101, No. 1: 36-44 (July 4, 1935).
(262) Michaelson, J. L., *Gen. Elec. Rev.* 38, No. 4: 194-96 (April, 1935).
(263) Judd, D. B., *Paper Trade J.* 100, No. 21: 40-42 (May 23, 1935).
(264) Hunter, R. S., *Paper Trade J.* 100, No. 26: 37 (June 27, 1935).
(265) Judd, D. B., *J. Research Natl. Bur. Standards* 19, No. 3: 287-317 (Sept., 1937).
(266) Laughlin, E. R., and Kress, O., *Paper Trade J.* 100, No. 8: 110-17, 119, 121, 123, 125, 127 (Feb. 21, 1935).
(267) Forrest, J. W., *Paper Trade J.* 97, No. 22: 38-39 (Nov. 30, 1933).
(268) Hatch, R. S., and Houff, H. A., *Pac. Pulp Pap. Ind.* 7, No. 10: 11-14 (October, 1933); *Paper Trade J.* 97, No. 26: 34-36 (Dec. 28, 1933).
(269) Judd, D. B., *Paper Trade J.* 103, No. 8: 38-44 (Aug. 20, 1936).
(270) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 18: 47-53 (May 6, 1937).
(271) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 19: 51-61 (May 13, 1937).
(272) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 20: 45-49 (May 20, 1937).
(273) Davis, M. N., Roehr, W. W., and Malmstrom, H. E., *Paper Trade J.* 101, No. 4: 31-36 (July 25, 1935).
(274) The Institute of Paper Chemistry, *Paper Trade J.* 101, No. 4: 31-36 (July 25, 1935).
(275) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 1: 39-41 (Jan. 7, 1937).
(276) The Institute of Paper Chemistry, *Paper Trade J.* 105, No. 9: 33-35 (Aug. 26, 1937).

Another characteristic emphasized by the work of the Central Grading Committee was that of gloss. The concepts and definitions of gloss are outlined by Judd *(277)*. The principles of gloss measurement and an instrument for measuring gloss are given by Hunter *(278)*. Kress and Morgan *(279)* describe the modified Oxford Glossmeter. The development of this instrument, now called the Bausch and Lomb Glossmeter, is outlined in the 5th Instrumentation Report from The Institute of Paper Chemistry *(280)*; the instrument is described in detail in the 6th report *(281)*, and the results of a comparative study of this instrument and the Ingersoll glarimeter are given in the 7th report *(282)*.

The microscopic examination of paper is outlined by Calkin *(283)*. The effect of humidity on the physical testing of paper is taken up in the 11th and 12th Instrumentation Reports from The Institute of Paper Chemistry. The first of these is a survey of the literature *(284)*, and the second *(285)* an experimental study of the effect of relative humidity on physical properties with respect to the hysteresis effect in changes from one humidity to another.

Andrews *(286)* criticizes the tests concerning strike and show-through of newsprint. He proposes to observe the rate of spread of a drop of ink oil. The 18th Instrumentation Report from The Institute of Paper Chemistry *(287)* describes an instrument for measuring the rate of oil penetration through paper.

A simple test for the subjective measurement of opacity and whiteness in paper coating pigments is described by Rafton *(288)*. The actual definition of opacity and methods for measuring this value have been the subject of a number of reports. Judd *(289)* discusses the sources of error in measuring opacity; in a second paper *(290)* he describes opacity standards made of opal glass and in a third paper *(291)* he takes up the relation between contrast ratio and printing opacity. In a series of three papers by Steele *(292-294)* opacity is taken up fundamentally, a precision opacimeter is described, and the opacifying power of fibers and fillers is determined. Davis *(295)* describes a simple and reliable photo-electric opacity tester and Forrest *(296)* gives the details of the instrument as developed commercially.

(277) Judd, D. B., *Am. Dyestuff Rptr.* 26, No. 8: 234-35 (April 19, 1937).
(278) Hunter, R. S., *Paper Trade J.* 99, No. 7: 38-40 (Aug. 16, 1934).
(279) Kress, O., and Morgan, H. W., *Paper Trade J.* 100, No. 26: 41-42 (June 27, 1935).
(280) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 1: 42-45 (Jan. 7, 1937).
(281) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 2: 42-44 (Jan. 14, 1937).
(282) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 2: 45-47 (Jan. 14, 1937).
(283) Calkin, J. B., *Paper Trade J.* 99, No. 22: 27-36 (Nov. 29, 1934).
(284) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 14: 40-46 (April 8, 1937).
(285) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 15: 45-48 (April 15, 1937).
(286) Andrews, I. H., *Pac. Pulp Paper Ind.* 11, No. 3: 20-21 (March, 1937).
(287) The Institute of Paper Chemistry, *Paper Trade J.* 105, No. 8: 39-42 (Aug. 19, 1937).
(288) Rafton, H. R., *Paper Trade J.* 96, No. 26: 30-32 (June 29, 1933).
(289) Judd, D. B., *J. Research Natl. Bur. Standards*, 12, No. 3: 345-51 (March, 1934).
(290) Judd, D. B., *J. Research Natl. Bur. Standards*, 13, No. 3: 281-91 (September, 1934).
(291) Judd, D. B., *Paper Trade J.* 101, No. 5: 40-41 (Aug. 1, 1935).
(292) Steele, F. A., *Paper Trade J.* 100, No. 12: 37-42 (March 1, 1935).
(293) Steele, F. A., *Paper Trade J.* 101, No. 17: 31-35 (Oct. 24, 1935).
(294) Steele, F. A., *Paper Trade J.* 104, No. 8: 157-58 (Feb. 25, 1937).
(295) Davis, M. N., *Paper Trade J.* 96, No. 19: 38-40 (May 11, 1933).
(296) Forrest, J. W., *Instruments* 6, No. 10: 200 (Oct., 1933).

Instruments for the determination of porosity are described by Campbell and Masten *(297)*, Carson *(298)* and by Williams *(299)*. Carson *(300)* has used his tester for determining the effect of experimental conditions on the measurement of air permeability.

The Bekk smoothness tester as an aid in studying the printing quality of paper has been investigated by Wemhoff, Simmons, and Boyce *(301)*, and found to be of value. Williams *(302)* tells of the relation of smoothness and plane porosity to printing qualities of paper. Three comprehensive papers on smoothness have appeared in the Instrumentation series of The Institute of Paper Chemistry. The first *(303)* analyzes "smoothness," the second *(304)* presents the correlation between the Bekk and Gurley instruments, while the third *(305)* refers to a new electrical capacitance method for measuring smoothness.

Adams and Bellows *(306)* have developed a stiffness tester on the same principle as that employed by the mechanical engineer in testing the deflection of beams. Clark *(307)* has reviewed the various methods for determining the stiffness or flexibility of paper and paper boards. A simple method is presented. The Instrumentation series of The Institute of Paper Chemistry *(308)* includes a comparison of the Carter and Gurley stiffness testers. The values obtained by the first are very nearly proportional to the readings on the second. A second instrumentation study from the same source *(309)* gives a comparison of the Gurley and the Smith-Taber instruments. Readings from one instrument are reproducible on the other.

Transparency of paper may be determined on the Westinghouse Trans-O-Meter according to Staege *(310)*. The fundamentals of glassine transparency from the psychological standpoint are discussed in some considerable detail by Wicker *(311)*. He concludes that the capacity for transmitting rays of light without scattering is the single property of a sheet which dominates all others in determining transparency. The prime essential to transparency is sharpness of resolution of image when viewing an object at some distance. The Instrumentation series from The Institute of Paper Chemistry includes a study of the transparency of tinted white glassines *(312)*. An instrument is described for the accurate measure of this transparency.

(297) Campbell, J., and Masten, R. A., *Paper Trade J.* 96, No. 23: 39-40 (June 8, 1933).
(298) Carson, F. T., *J. Research Natl. Bur. Standards*, 12, No. 5: 567-85 (May, 1934).
(299) Williams, F. M., *Paper Trade J.* 98, No. 15: 41-43 (April 12, 1934); 105, No. 8: 45-47 (Aug. 19, 1937).
(300) Carson, F. T., *J. Research Natl. Bur. Standards*, 12, No. 5: 587-608 (May, 1934).
(301) Wemhoff, B. L., Simmons, R. H., and Boyce, D. H., *Paper Trade J.* 96, No. 4: 36-40 (Jan. 26, 1933).
(302) Williams, F. M., *Paper Trade J.* 100, No. 23: 37-39 (June 6, 1935).
(303) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 11: 43-46 (March 18, 1937).
(304) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 12: 62-66 (March 25, 1937).
(305) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 13: 30-33 (April 1, 1937).
(306) Adams, F. W., and Bellows, J., *Paper Trade J.* 96, No. 9: 37-40 (March 2, 1933).
(307) Clark, J. d'A., *Paper Trade J.* 100, No. 13: 41-44 (March 28, 1935).
(308) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 22: 43-45 (June 3, 1937).
(309) The Institute of Paper Chemistry, *Paper Trade J.* 104, No. 21: 43-47 (May 27, 1937).
(310) Staege, S. A., *Paper Trade J.* 98, No. 24: 34-35 (June 14, 1934).
(311) Wicker, D. B., *Paper Trade J.* 105, No. 17: 31-40 (Oct. 21, 1937).
(312) The Institute of Paper Chemistry, *Paper Trade J.* 105, No. 2: 41-48; 105, No. 3: 35-44 (July 8-15, 1937).

(To be concluded)

Reduction of Pulp and Paper Wastes in Stream Cleaning Program in Wisconsin

by L. F. Warrick[1] and F. J. McKee[2]

During the year 1937 a cooperative survey of wastes produced by pulp and paper mills in the state was made by the Wisconsin pulp and paper industry and the Bureau of Sanitary Engineering of the Wisconsin State Board of Health. These studies were started in 1926 and 1929, and have been conducted annually in a routine manner since 1931. Results of previous years' studies have been published.[3] Data from 57 miles were collected during the 1937 survey and have been compiled so as to permit comparison with results obtained in previous years, and cover progress in waste reduction.

Field work in connection with the survey included contacting the mill officials and discussing improvements outlined in previous reports. Details concerning the white water recirculation systems and other methods of reducing fiber losses were ascertained by inspection of the machines and appurtenances as well as by discussion with mill managers, superintendents, chemists, and machine operators. Any changes in the white water system made since the previous survey were noted. Sketches or flow diagrams of the white water systems were made with the assistance of mill officials and were later incorporated in the report sent to the individual mills.

The usual mill waste sampling program consisted of the installation of weirs or other flow measuring devices in the mill sewers, and the measurement of waste flows with the collection of samples at regular intervals throughout a week's operation. (Fig. 1.) Sewers which had a reasonably constant discharge were sampled and the flow measured at 2-hour intervals, 24 hours per day during the test. In some sewers in which the flow was intermittent, such as blowpit sewers, samples and flow measurements were taken at 5 or 10 minute intervals over a period of one or two cycles. Samples were sent to the Wisconsin State Laboratory of Hygiene where analyses were made for fixed and volatile suspended solids, fixed and volatile soluble solids, pH., oxygen consumed, and biochemical oxygen demand. (See Fig. 2) These results were reported as parts per million. It was assumed, except where certain necessary corrections were made, that the volatile suspended solids consisted wholly of fiber. With additional information regarding waste volumes and mill production these analyses were calculated to show the percent of mill production lost through the sewer.

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[3] Stream Pollution in Wisconsin, Special Rep., Wis. State Bd. of Health (1927).

L. F. Warrick and K. M. Watson, *Paper Trade J.* (June 12, 1930).
J. M. Holderby, *Paper Trade J.* (April 6, 1933).
L. F. Warrick and J. M. Holderby, *Paper Trade J.* (May 10, 1934).
J. M. Holderby and L. F. Warrick, *Paper Trade J.* (July 18, 1935).
L. F. Warrick and J. M. Holderby, *1936 Year Book and Program. The American Pulp and Paper Mill Superintendents Association, Inc.*

FIG. 1.
Equipment for measuring and collecting composite samples at a Wisconsin pulp mill.

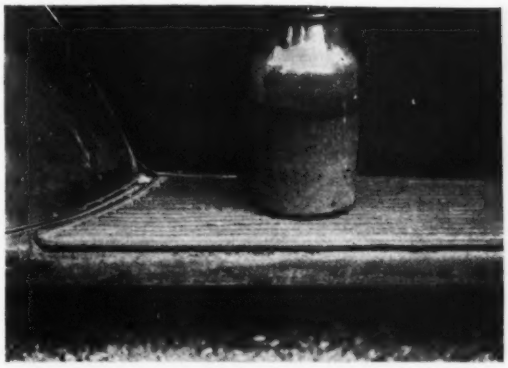

FIG. 2.
Sulphite pulp mill acid storage tank sludge: Tests and experience show need for disposal other than into streams to avoid damage to fish and aquatic life.

Results of 1937 Survey

Individual reports containing summaries of fiber loss data and recommendations regarding the reduction of these losses have been submitted to each mill surveyed. A tabulation showing all mills surveyed in-

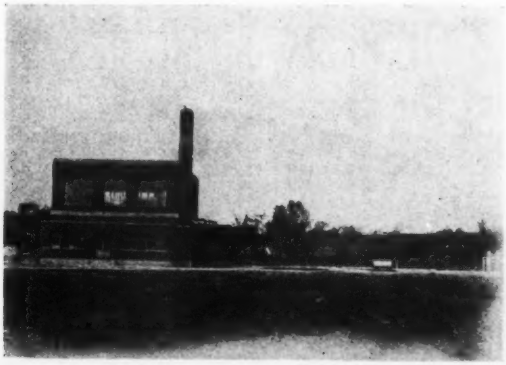

FIG. 3.
Treatment plant designed for removing pollutional material from mixture of sewage and paper mill wastes.

dicates that the average fiber loss has decreased from 2.4 per cent of production in 1936 to 2.0 per cent in 1937. A more accurate comparison is possible by means of Table I which lists only those mills, data from which is believed to be quite accurate and which is available for several previous years. Averages have been weighted according to the mill production. Fiber values ranging from $15 to $60 per ton have been assigned to these mills, varying with the type of paper produced. These figures have been previously reported*(3)*. The value of the daily fiber loss from this group of mills has been computed by weighing these values according to the mill production. An average value of $35.87 per ton for fiber lost in the white water was obtained. On this basis value of fiber lost from this group has decreased in $1420.00 per day.

Mills manufacturing paper only have shown an increase in waste volume for the third consecutive year. However, the current fiber loss of 1.3 per cent is the lowest on record for this group of mills.

The population equivalents listed in the table show the number of persons who, by the production of domestic sewage, would produce an oxygen demand on the stream equivalent to the wastes from the manufacture of one ton (oven-dry weight) of the mill product.

The population equivalent has remained quite constant in spite of the decreasing fiber losses. This indicates that the pollutional loading as measured by the oxygen demand test is not primarily caused by the fiber, but by unstable organic substances dissolved in the wastes. The fiber exerts a long-time oxygen demand, and often results in the formation of a sludge bed on the river bottom which prevents the growth of normal vegetation, and which may, during decomposition rise to the surface, causing nuisances.

TABLE II.—1937 DATA ON PAPER MILLS WITH AND WITHOUT BLEACH WASTES

Type of Paper Mill	No.	Waste Flow M. gal. per ton	Fiber Loss Per cent	Pop. Equivalent Persons per ton
Mills without bleach wastes.	24	30.8	1.8	26.0
Mills with bleach wastes...	5	33.5	1.3	39.9
All mills	29	31.3	1.7	28.5

It will be seen from Table II that average waste volume from mills with bleach plants is larger than other mills but that fiber loss is smaller. All of the mills with bleach plants are equipped with efficient rotary filters for use as bleach washers. In several cases paper machine white water is used in place of fresh water in the bleach plant. These filters are capable of delivering a filtrate containing a very low concentration of fiber, thus keeping losses below the average. The concentration of fiber in whitewater from these washers varies from 0.32 to 1.00 pounds per 1000 gallons and averages 0.71 pounds per 1000 gallons. These figures are shown in Table III.

TABLE I.—PULP AND PAPER MILL WASTE STUDIES—COMPARISON OF RESULTS FROM IDENTICAL MILLS—1932-1937

	Waste Flow Million Gallons Per Ton						Fiber Loss to Sewer Per Cent of Production						Population Equivalent Persons Per Ton				
	1937	1936	1935	1934	1933	1932	1937	1936	1935	1934	1933	1932	1937	1936	1935	1934	1932
PAPER MILLS (PAPER ONLY)																	
1	21.0	21.0	22.0	14.4	22.2	17.4	1.3	1.3	1.5	1.4	0.7	0.5	27.5	20.4	27.6	21.6	8.4
2	6.1	16.9	10.9	22.1	15.5	4.3	0.8	1.5	0.9	1.0	2.4	0.3	7.8	40.8	14.4	26.4	3.1
3	104.0	87.5	109.8	83.1	93.9	100.2	4.7	4.4	4.5	5.1	3.3	2.6	31.1	44.4	52.8	63.0	26.9
4	29.7	36.2	36.7	39.9	26.8	55.5	2.4	3.9	1.6	4.0	0.4	5.7	28.7	48.0	39.6	40.8	79.7
5	9.6	11.5	12.6	12.5	16.3	1.3	0.4	0.3	0.3	0.8	1.1	0.1	11.4	13.8	14.4	16.2	0.5
6	12.7	11.0	6.7	10.6	12.9	8.7	1.2	0.6	0.4	0.6	0.2	0.4	....	6.0	3.0	2.4	3.1
7	20.0	22.3	21.3	18.2	43.4	23.6	0.6	0.9	0.8	0.9	1.1	0.8	21.5	7.2	16.8	8.4	7.2
8	15.4	21.1	15.5	27.0	25.1	19.6	1.3	1.4	1.2	2.6	2.0	1.5	47.3	13.8	3.6	11.4	17.6
9	7.4	17.6	7.7	4.7	5.6	29.9	0.8	2.7	0.9	0.8	0.3	6.0	13.8	16.2	4.8	4.8	26.9
10	51.7	63.3	57.6	67.4	112.6	102.0	0.6	1.9	0.5	0.9	1.8	2.7	21.5	42.0	27.6	76.8	36.7
11	12.3	18.2	12.2	10.2	15.1	22.7	1.0	1.8	0.9	0.9	1.9	3.1	16.8	28.2	11.4	7.2	39.0
12	18.3	19.3	39.2	38.4	28.1	20.8	2.9	4.8	9.3	10.8	4.6	2.6	....	13.8	21.0	13.8	14.1
13	8.1	16.1	4.9	14.0	22.9	69.8	1.8	3.3	0.7	4.5	1.1	9.5	9.6	18.1	3.0	6.0	100.9
14	26.1	26.1	17.1	27.2	22.2	19.5	2.0	2.4	1.2	4.3	1.2	2.2	42.6	22.2	18.6	19.2	29.2
15	22.9	23.5	33.8	26.4	3.1	35.9	0.4	0.7	3.2	0.4	0.1	2.1	39.5	15.6	36.0	15.6	6.6
16	26.3	43.1	38.8	48.0	70.4	85.1	0.4	1.1	1.3	1.9	0.5	2.2	53.4	56.4	63.6	16.8	35.7
17	34.4	24.0	29.7	37.8	27.8	18.8	0.8	1.4	2.4	4.8	3.6	4.1	40.7	40.8	11.4	26.4	28.7
18	....	20.1	15.6	14.7	20.4	8.5	...	4.1	1.7	3.5	4.9	1.3	....	2.4	13.8	10.8	21.9
19	32.9	37.8	25.9	43.9	35.2	22.7	2.4	1.6	2.9	7.5	3.6	1.5	36.0	42.6	21.6	45.6	17.2
20	28.5	30.4	23.0	42.7	20.7	17.1	1.7	1.6	1.6	1.8	0.6	0.5	23.3	25.8	28.8	54.0	20.4
21	49.1	35.1	49.7	50.7	67.5	60.5	1.9	1.6	1.5	2.2	4.3	5.9	52.7	46.2	74.4	158.4	155.5
Aver.*	23.9	22.5	20.3	24.4	24.7	24.4	1.3	1.9	1.5	2.6	1.7	2.3	24.2	24.3	17.6	22.0	25.3
SULPHITE MILLS (PULP ONLY)																	
1	35.4	51.9	59.9	87.7	85.7	73.4	1.8	3.6	1.7	5.3	7.2	4.5	414	1161	1198	1200	1322
2	42.2	43.3	53.8	104.3	67.3	70.4	1.6	3.8	3.2	4.7	2.4	6.5	1534	563	574	1079	1468
3	38.3	37.8	67.8	48.2	55.8	23.2	1.4	1.4	1.8	1.3	1.0	2.4	....	1581	1334	1483	1227
4	48.0	60.2	49.9	54.2	42.2	36.0	2.5	2.3	6.4	2.6	2.2	1.4	1272	1142	1266	1905	1157
5	70.0	66.5	103.3	47.7	52.6	48.0	4.1	3.1	3.2	3.1	1.3	1.1	....	724	535	1648	1480
6	98.5	86.6	90.6	73.4	65.1	59.2	3.8	3.7	6.2	5.0	2.5	2.3	1550	1432	771	1703	1483
7	24.4	23.1	33.5	20.9	23.1	13.4	0.7	1.4	1.3	1.2	0.9	1.8	653	1364	1393	1153	2560
8	57.2	50.2	54.5	67.5	54.3	57.3	2.0	1.8	3.7	2.3	2.6	4.5	3610	877	392	1667	1259
9	....	99.6	51.2	43.5	30.9	87.5	...	6.4	0.8	1.6	1.5	2.2	....	2849	1072	1702	1953
10	78.0	65.9	67.6	95.1	98.3	161.0	3.2	2.4	1.7	8.8	2.7	3.9	764	1044	1672	1871	698
Aver.*	55.9	58.7	64.6	63.8	56.8	74.9	2.4	3.0	3.5	3.5	2.4	3.0	1446	1188	930	1522	1520
GROUNDWOOD MILLS (PULP ONLY)																	
1	12.3	6.0	3.7	13.8	8.6	23.4	1.6	0.8	1.3	4.0	1.7	8.1	25.8	4.2	3.6	21.0	79.1
2	2.2	7.3	12.3	33.2	42.4	3.5	0.3	1.3	1.3	2.9	3.1	0.6	....	13.8	12.0	....	9.0
3	Nil	0.1	Nil	0.4	1.5	22.8	Nil	Nil	Nil	0.1	0.2	2.5	Nil	1.2	Nil	0.6	40.8
Aver.*	4.7	4.3	5.1	15.1	16.7	16.9	0.6	0.7	0.8	2.2	1.6	3.7	12.2	6.1	5.0	10.3	43.2
MISCELLANEOUS MILLS (PULP OR PAPER OR BOTH)																	
1	17.3	23.5	18.1	26.6	21.9	22.5	2.0	3.2	2.8	4.2	3.4	2.6	32.4	19.2	18.0	16.8	31.2
2	21.7	16.2	21.5	27.2	28.4	33.7	1.3	1.7	2.0	1.9	2.8	2.5	72.5	42.6	55.2	83.4	51.6
3	17.4	15.2	15.5	18.6	18.3	30.0	5.0	5.0	3.8	0.5	9.6	5.1	211.0	41.4	31.8	18.6	50.3
4	43.7	37.3	34.4	33.9	55.2	37.8	2.3	1.5	2.5	3.1	2.8	1.5	138.3	105.0	84.6	97.8	96.0
Aver.*	27.5	25.3	24.6	29.0	35.0	31.6	1.9	2.2	2.4	3.0	3.1	2.3	85.0	55.9	53.0	66.3	59.9
GRAND AVER.*																	
38	31.7	31.5	31.8	34.9	34.4	38.3	1.7	2.2	2.1	2.8	2.1	2.5	364.0	328.1	257.6	420.0	416.2

	1937	1936	1935	1934	1933	1932
Total fiber loss, tons per day.....	39.50	53.27	50.85	67.80	50.85	60.53
**Value of fiber lost per day.....	$1420	$1911	$1824	$2432	$1824	$2171

* All averages weighted to correct for differences in mill production.
** Based on weighted average value per ton of $35.87.

TABLE III.—FIBER CONCENTRATION OF BLEACH WASHER WASTES

Mill No.	Description of Waste	Fiber Concentration Pounds per 1,000 gallons
1	Machine and bleach wastes	1.00
2	Bleach wastes	0.93
3	Main mill sewer (mostly bleach waste)	0.32
4	Total mill (mostly bleach waste)	0.32
5	First and second stage bleach wastes	0.97
	Average	0.71

The use of these filters in paper mills without bleaching plants is not as extensive as in mills doing their own bleaching. It is believed that this is the reason for the lower loss from mills with bleach plants. The population equivalent of wastes from bleaching mills is higher than that from straight paper mills. This is to be expected because of the additional amount of organic solids removed from the pulp by the bleaching operation.

Reference to Table IV will show the distribution of all paper and sulphite pulp mills included in the 1937 survey on the basis of fiber losses and unit waste volumes. Ten paper mills, or 34.5 per cent have losses of 1 per cent or less, while 22 or 75.9 per cent have losses of 2 per cent or less. The highest recorded loss in 1937 is 5.7 per cent. Eleven mills or 38.0 per cent discharge waste volumes of 20,000 gallons or less per ton of paper. Twenty-three mills or 79.4 per cent discharge 40,000 gallons or less per ton. The highest recorded waste flow for 1937 is 112,900 gallons per ton and is at the same mill which has the largest per cent of fiber loss.

Sulphite pulp mills have shown some reduction in waste volumes and a considerable reduction in fiber loss since 1936 as shown by Table I. The weighted average fiber loss has been reduced to 2.4 per cent of the pulp production.

The average population equivalent of the sulphite pulp mill wastes is believed to be representative. Abnormally low values were reported for mills numbered 1, 7, and 10. These low values coincide in all cases with reported soluble solids of less than 1800 pounds per ton of pulp. Since the theoretical discharge of soluble solids is about 2700 pounds per ton of pulp, there is, no doubt, some error in the methods of collection or in the laboratory analyses of these particular samples.

Table IV shows that two sulphite pulp mills or 15.4 per cent of the total have fiber losses or 1.0 per cent or less. Six mills, or 46.2 per cent have losses of 2.0 per cent or less. The largest recorded loss in 1937 is 4.1 per cent. In 1936 two mills were reported as having fiber losses in excess of 5.0 per cent. One mill or 7.7 per cent has a waste flow of less than 20,000 gallons per ton of pulp. Five mills, or 38.5 per cent have waste flows of 40,000 gallons or less per ton. The largest waste flow recorded this year is 100,000 gallons per ton. This same mill has the second largest fiber loss (3.9 per cent).

Mill No. 2 has shown a reduction in fiber loss from 3.8 per cent in 1936 to 1.6 per cent in 1937. This reduction was accomplished by the installation of a rotary vacuum filter for use as an interstage bleach washer. This has resulted in saving about two tons of fiber per day, which represents a considerable financial gain to the mill. This washer delivers filtrate containing 0.63 pounds of volatile suspended solids per 1000 gallons.

It is evident that the installation of modern vacuum filters will do a great deal to reduce fiber losses from paper and chemical pulp mills. The replacement of older and less efficient equipment by these filters is to be recommended in the interests of both efficient operation and stream pollution reduction.

Sulphite Waste Liquor

The greatest stream pollution problem in connection with pulp and paper mill wastes is presented by the discharge of waste sulphite liquor. The waste sulphite liquor produced in the manufacture of one ton of pulp is equivalent in pollutional value to the daily domestic sewage from about 1500 persons.

Various processes have been undergoing development for the recovery of pollutional substances in waste sulphite liquor. At present the Howard process for the treatment and recovery of waste sulphite liquor has shown itself to be feasible of operation as far as the mechanical features are concerned. Details of the operation have been published.[4] Recent tests have indicated that the process is capable of reducing the biochemical oxygen demand of the treated waste liquor by more than 90 per cent. Since the more dilute blowpit drainage is not treated, the overall b.o.d. reduction is less than this figure. Some further study is needed regarding the fuel value, and methods of burning the organic product. The Advisory Committee on Waste Disposal of the Wisconsin Pulp and Paper Industry is preparing a report on the economics of the process. When the practicality of the process is demonstrated, its adoption or the adoption of some other process providing a similar reduction in stream pollution will doubtless be required of sulphite mills operating in the state.

Work is to be conducted on the disposal of certain wastes not reclaimed by pulp and paper mills at municipal sewage treatment plants. Wastes from

[4] Guy C. Howard, *Paper Trade J.* (July 2, 1936).

TABLE IV.—DISTRIBUTION OF PAPER AND SULPHITE MILLS ON BASIS OF FIBER LOSS AND WASTE FLOW—1937

Range of Loss	No. Mills	Per Cent	Range of Volume	No. Mills	Per Cent
PAPER MILLS					
0.0%—1.0%	10	34.5	0 gal.— 20,000 gal.	11	38.0
1.1 —2.0	12	41.4	20,001 — 40,000	12	41.4
2.1 —3.0	4	13.8	40,001 — 60,000	3	10.3
3.1 —4.0	1	3.4	60,001 — 80,000	0	0.0
4.1 —5.0	1	3.4	80,001 —100,000	1	3.4
5.1 and over	1	3.4	100,001 and over	2	6.9
Total	29	99.9	Total	29	100.0
SULPHITE MILLS					
0.0%—1.0%	2	15.4	0 gal.— 20,000 gal.	1	7.7
1.1 —2.0	4	30.8	20,001 — 40,000	4	30.8
2.1 —3.0	2	15.4	40,001 — 60,000	4	30.8
3.1 —4.0	4	30.8	60,001 — 80,000	2	15.4
4.1 —5.0	1	7.7	80,001 —100,000	2	15.4
5.1 and over	0	0.0	100,001 and over	0	0.0
Total	13	100.1	Total	13	100.1

some paper mills are now being disposed of through municipal sewage treatment plants and it is proposed where practical to extend this means of disposal to other paper mills.

Groundwood mills in the state have shown a small reduction in losses in the past year as shown in Table 1. Losses are reduced in these mills by extensive recirculation of white water. Since the lapped pulp leaving the mill contains more water than the incoming wood, it is possible to recirculate 100 per cent of the white water and still add fresh water to the system. In all cases it has been recommended that slivers, screenings, and other refuse be dewatered and disposed of by means other than discharge to the river.

"Miscellaneous mills" includes paper mills which are complicated by the types of raw material used. Included are mills operating on reclaimed paper, slushed stock, and kraft pulp and paper.

The average losses from this representative group of mills have shown a reduction of 1.7 per cent. This is the first year that this loss has been below 2.0 per cent. It is anticipated that continued improvements in the mill will further reduce this loss to the standard of 1 per cent set up in the waste utilization and stream improvement program.

The establishment of routine white water surveys by the mill staff is to be highly recommended. Such a routine will permit the ready detection of abnormally large losses so that steps in the direction of loss reduction may be taken in an effective manner.

Of 42 mill units reported in this survey, 20 or 48 per cent maintained routine waste surveys. Ten additional mills, or 24 per cent, reported that surveys were conducted occasionally, or that part of the mill was surveyed regularly. The remaining 12 mills, or 28 per cent, maintained no such surveys.

Conclusions

In conclusion it may be stated that the 1937 survey has shown that the mills of the state have made considerable progress in the reduction of losses. Since 34.5 per cent of the paper mills and 15.4 per cent of the sulphite pulp mills, fairly representative of the industry, have reduced fiber losses to 1 per cent or less, it is to be expected that further improvements and establishment of more effective white water system control procedures will bring other mill fiber losses below 1 per cent.

The development of a process for treatment of waste sulphite liquor indicates that a practical solution to this important problem, which will be particularly applicable to the Wisconsin mills, will be available at an early date. The process accomplishes a large reduction in the pollution constituents of the sulphite wastes.

The Washing of Bleached Sulphite and The Introduction of a New Method for Its Control

Editor, PAPER TRADE JOURNAL

In the PAPER TRADE JOURNAL of September 15 a paper with the above title was published, dealing with the investigation of a new and reliable method of controlling the operation of washing bleached pulps. Realizing the importance of technical control in this field, I wish to add a supplementary comment to my article.

The method of determining the O-number (oxygen number) of bleached pulps represents a most suitable means for the numerical determination of the efficiency of pulp washers. This is discussed and illustrated by the following example, which corresponds to actual mill operation.

In order to calculate the washer efficiency by the use of the O-numbers, it is necessary to establish a suitable basis for comparison. The ground for comparison is the oxygen demand of the stock before and after the washer operation calculated on the basis of equivalent amounts of oven-dry pulp.

The case being illustrated is characterized by the operating conditions shown in Table I.

TABLE I

	Consistency Per cent	O-Number
Pulp entering the washer	0.9	12.8
Pulp leaving the washer	4.8	3.2

According to the definition of the O-number, 12.8 mg. of oxygen are required by each 100 cc. of the liquid associated with the pulp entering the washer. The amount of oven-dry stock associated with each 100 cc. of the liquid is calculated as follows:

$$(1) \qquad \frac{C \times 100}{100 - C} = \frac{0.9 \times 100}{99.1} = 0.91 \text{ grs. oven-dry pulp}$$

C = consistency of the pulp.

bearing in mind that 100 cc of liquid has the O-number of 12.8 and that 100 cc of liquid is associated with 0.91 grams of oven-dry pulp.

From this it follows that the O-number of 12.8 applies to 0.91 grams of oven-dry pulp. Thus, the oxygen demands corresponding to 1 gram of oven-dry pulp before the washer is calculated as follows:

$$(2) \qquad 0.91 : 12.8 = 1 : X$$

and amounts to 14.0 mgrs. of oxygen.

Calculations similar to those before the washer are applied to the operating conditions of the pulp before leaving the washer.

From the data in Table I, therefore,

$$(1) \qquad \frac{4.8 \times 100}{95.2} = 5.0 \text{ grams pulp in 100 cc. of liquid}$$

$$(2) \qquad 5 : 3.2 = 1 : X$$

$X = 0.64$ Oxygen demand in mgrs. corresponding to 1 gram of oven-dry pulp.

The difference in the oxygen demand before and after the washer on the basis of one gram of oven-dry pulp represents the organic matters removed by this operation.

Oxygen demand before washing .....14.0 mg.
Oxygen demand after washing ..... 0.64 mg.

Oxygen demand corresponding to the organic matters removed .....13.36 mg.

The percentage of organic matters removed by the washer operation is

$$\frac{13.36 \times 100}{14.0} = 95.0 \text{ per cent}$$

and represents the efficiency of the washer.

This method of determining the washer efficiency can be satisfactorily applied to every washing operation dealing with the removal of organic matters, whether in the bleach plant, the sulphite mill, or the kraft mill.

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Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Paper Specialties

Molding of Pulp or Other Fibrous Material. Hawleys Products Ltd. Brit. pat. 469,882 (Jan. 2, 1936).—Hollow articles are formed in a porous die (female mold), the liquid being removed by difference of pressure; meanwhile the interior is pressed by pneumatic pressure inside a deformable male mold of rubber or the like, which may also be covered with porous material affording drainage.—A.P.-C.

Surface Treatment of Paper or Cardboard. I. G. Farbenindustrie A. G. Belg. pat. 422,069 (July 31, 1937).—The sheet on the paper machine wire is treated with solutions of water-soluble cellulose esters or with alkaline solution of water-insoluble cellulose esters.—A.P.-C.

Warping of Showcards; How to Overcome This Trouble. Paper Box Bag Maker 85, no. 2:65 (Feb., 1938); B.I.P.C. 8:273.—A showcard which had warped was sent for investigation to the British Printing and Allied Trades Research Association (PATRA). The card consisted of a board on which was mounted a print and the back was lined with another paper; a hot glue had been used as adhesive. Warping of board may be due to the negligence of the following conditions. The board should be cut with machine direction or grain running parallel to the longer side of the show card; print and lining paper should be cut with their grain parallel to the longer side of the showcard; and printing paper and lining paper should have approximately the same expansions when wetted with water. The adhesives used should contain the minimum of water and be applied in a very thin film. Not all of these conditions had been fulfilled in the specimen under investigation. When a sample showcard complying with all these requirements was made up there was only a very slight warp on the printed side in the short direction.—C.J.W.

Use of Straw Board. Kartonnagen-u. Papierwaren-Ztg. 42, no. 5:48-49 (Feb. 4, 1938); B.I.P.C. 8:309.—The manufacturer of shipping containers should be informed for what purpose his goods are intended, since, for instance, straw board is the least suitable for wrapping and storing metal articles; residual alkali from the digesting process is liable to cause oxidation of the metal surfaces. This danger may be reduced by lining the containers with suitable acid-free papers. Care must also be taken that the adhesives do not contain harmful substances.—C.J.W.

Machinery

High-Speed Newsprint Operation. A. J. Edward and G. D. Davidson, Pulp Paper Mag. Can. 39:79-83, 95 (Feb., 1938).—A discussion of the various problems encountered in speeding up the paper machines at the Dalhousie mill of Canadian International Paper Co. from 1100 to 1400 ft. per min.—A.P.-C.

Fourdrinier Paper Machine. Beloit Iron Works. Brit. pat. 470,057 (Aug. 9, 1937).—Pulp from a valve-controlled pipe enters a division of a flowbox and flows across the traveling wire cloth at the bottom of the box, part being carried beneath a ledge of a slice or partition in the box and the remainder flowing round the end of the slice and again across the wire whereon a second pulp layer is thus deposited, excess pulp discharging through a pipe having a valve.—A.P.-C.

Fourdrinier Paper Machine. Beloit Iron Works. Brit. pat. 471,001 (Aug. 26, 1937).—Paper pulp flows upwardly through a breast box through a spout at a lower level than the pulp surface in the box and onto an area of the wire cloth confined by walls or slices adjustable in height and position, the drainage below such area being regulated so that, e.g., 50 to 90% of the web formation occurs there.—A.P.-C.

Fourdrinier Paper Machine. Beloit Iron Works. Brit. pat. 471,400 (Sept. 3, 1937).—The wire cloth of the machine is supported as disclosed in Brit. pat. 471,001, and the hydraulic pressure urging the rolls upwardly in their supports is varied in accordance with variations in the load carried by them, the load due to suction on the wire-cloth being included.—A.P.-C.

Cylinder Paper Machine. Gerould T. Lane and Wendel Butterfield, assignors to Kodak Ltd. Brit. pat. 472,093 (ept. 16, 1937).—In making paper, the fibers of paper stuff are laid on a making-wire passing around a cylinder immersed in the stuff by providing a pressure difference in the stuff outside the cylinder over the pressure in the liquid in the cylinder, undesired escape of paper stuff from the space between a dam, lying close to but spaced from the making-wire, and the wire being prevented by maintaining a local pressure difference in the stuff at this place equal to the pressure difference on the making-wire at the place where the fiber is being deposited.—A.P.-C.

Pneumatic Conveyors in Mill Operation. Grempe. Wochbl. Papierfabr. 68, no. 46:869-71 (Nov. 13, 1937).—Although pneumatic conveyors, on the average, require more power than mechanical conveyors, other advantages of the pneumatic more than offset this. When material is to be conveyed from one source to several places, a pressure system is used, but when material is to be conveyed from several sources, a vacuum system is used. Description of equipment and applications.—J.F.O.

Piling and Conveying Pulp Wood. Bottger. Wochbl. Papierfabr. 68, no. 48:921-25 (Nov. 27, 1937).—By means of diagrams and several illustrations, the author describes a system used by a paper mill for conveying and piling pulp wood obtained from railroad cars.—J.F.O.

Investigation Over the Power Consumption of Super Calenders. Rudolf Dittmar, Zellstoff u Papier 18, no. 1:12-15; no. 2:57-59 (Jan., 1938).—The author first describes the calender and winder rolls used in the investigation, factors relating to the finish of the sheet; a lineal pressure of 166-186 kilograms per centimeter gives a dull finish, 186-206 gives a good finish and 206-126 gives a high finish, all figures dependent on moisture, sheet characteristics, etc., the bearings of the calender were given special study, and in conclusion the author divides the power consumption thusly; 13.02 KW or 10 per cent for bearing friction, 12.0 KW or 9 per cent for the winder and for the friction "the work done" on the sheet 110 KW or 81 per cent.—J.F.O.

Cutter. Fromagerie Le Castel, Geneva, Switzerland. Ger. pat. 648,075 (Jan. 1, 1935).—J.F.O.

Process for the Sorting of Wood Chips. K. Granqvist, Kopmansholmen. Swed. pat. 88,615 (Dec. 18, 1933).—The chips are conveyed to inclined parallel bars which are given an up and down motion and a to and fro motion.—J.F.O.

Knotter for Paper and Similar Fiberous Materials. Ph. Nebrich vorm. Reinicke & Jasper G.b.H., Kothen. Ger. pat. 648,655 (Dec. 19, 1935).—Addition to pat. 648,032. Method for motivating the cylinder.—J.F.O.

Considerations and Experiences in the Construction of Modern High Speed Cutter. Otto Wendt. Papier-Ztg. 63, no. 6:96-98; no. 7:114 (Jan. 19, 22, 1938); B.I.P.C. 8:288.—The author discusses important details of methods of fastening the knife and most suitable materials for the bed on which the paper to be trimmed rests.—C.J.W.

Embossing Calenders for Fine Papers. Papier-Ztg. 63, no. 5:76 (Jan. 15, 1938); B.I.P.C. 8:290.—Brief reference is made to the four methods of embossing fine papers, namely sheet platers, ordinary embossing calenders, transparent embossing with a special three roll calender, and linen embossing, where both rolls of the calender are covered with linen tissue.—C.J.W.

Centrifuge with Enclosed Walls for Screening Paper Stock and Similar Materials. Societe Essmat, Paris. Ger. pat. 647,736 (April 12, 1931).—J.F.O.

Wear of Felts and Practical Suggestions for Their Treatment. Z. Papier, Pappe, Zellulose, Holzstoff 56, no. 3/4:36-38 (Feb. 28, 1938); B.I.P.C. 8:290.—The greatest wear of Fourdrinier wires is caused by suction boxes and fatigue of the individual strands on account of continued bending stresses. The cleaning of wires with acids should be limited to unavoidable cases; the soured wire should not be under tension or the individual threads will stretch. The life of wet felts is increased through the use of soft rubber rolls, and careful washing at low temperatures without strong alkalies. A very long running record of a felt is usually not a good sign, because it indicates that the presses are not fully utilized and that their output could be increased. Wear of the felt edges indicates incorrect crowning of the rolls. Increasing the drying temperatures definitely decreases felt life. Satisfactory results have been obtained with asbestos felts, prepared from either wool and asbestos, or cotton and asbestos mixtures. The latter have a rather rough surface and are apt to mark the sheet; therefore, they cannot be used when the web is still moist and in a plastic condition. Wool-asbestos felts have a smoother surface; nevertheless their best application is also as dryer felts. The consumption of wet and dryer felts varies within very wide limits.—C.J.W.

Power

Economical Boiler Installation in a Paper Mill with a Recent Chain Stoker Grate. Reinhard Schulze. Wochbl. Papierfabr. 68, no. 49:961-65 (Dec. 4, 1937).—Description of the installation of a chain grate and tabulation of the results of test runs made on same. Many advantages resulted therefrom, such as, adaptability to low grades as well as high grades of coal, flexible to load changes, and efficient burning of the fuel.—J.F.O.

The Danger from Electrical Current. Wochbl. Papierfabr. 68, no. 44:832-33 (Oct. 30, 1937).—The author discusses the relative danger from the different types of electricity; static, direct and alternating; conditions which are and are not fatal to man and the causes of death from contact with electrical current.—J.F.O.

Coupling of Power and Heat in Summer and Winter Mill Operation. Otto Th. Koritnig. Wochbl. Papierfabr. 68, no. 42:792-94; no. 43: 813-15 (Oct. 16, 23, 1937).—The article deals in length on the couplings of various types of machinery for the production of power and heat in the most economical manner for both summer and winter operations.—J.F.O.

Fly Ash Prevention. Stanley Brown. Paper Trade J. 106, no. 8:118-122 (Feb. 24, 1938).—A description of the Buelle eliminator and a discussion of its performance and merits.—A.P.-C.

Three Kinds of Power. A. W. Loomis. Pulp Paper Mag. Can. 39:287-290 (March, 1938).—A description of the power plant layout of the mill of the Hinsdale Paper Manufacturing Co., which combines hydraulic, steam and Diesel motor installation.—A.P.-C.

Present Status of Air Conditioning Practice. V. P. Victor. Paper Trade J. 106, no. 8:184-195 (Feb. 24, 1938).—Fundamental principles underlying the design of various types of air-treating systems are outlined. Basic methods and equipment items are presented, with their respective cycles. Representative installations and their performances are described.—A.P.-C.

Centrifugal Pump Practice. G. H. Heyn. Pulp Paper Mag. Can. 39:215-219, 279-282 (Feb., March, 1938).—A brief discussion on correct and incorrect operating conditions of centrifugal pumps and some fundamental points of importance which should be considered when specifying centrifugal pumping equipment.—A.P.-C.

Miscellaneous

Annual Meeting of the German Association of Pulp and Paper Chemists and Engineers. December 1-4, 1937, Berlin. Wochbl. Papierfabr. 68, no. 50:983-86 (Dec. 11, 1937).—Resume of the entire meeting, including the business session and a short abstract of each paper given.—J.F.O.

Illumination of Work Rooms. Willi Hatlapa. Wochbl. Papierfabr. 68, no. 47:887-888 (Nov. 20, 1937).—Results of a survey made of the illumination of one hundred places of work and a further discussion of the correct illumination and the beneficial results to labor and product therefrom.—J.F.O.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING DECEMBER 3, 1938

SUMMARY

Cigarette paper .....1,245 cs.
Wall paper .....2 bxs., 11 bls., 29 cs.
Paper hangings .....4 bls., 3 cs.
Painted paper .....1 cs.
Newsprint .....14,429 rolls
Printing paper .....49 rolls, 3 cs.
Wrapping paper .....2,322 rolls, 268 bls., 67 pkgs.
Drawing paper .....61 cs.
Filter paper .....3 cs.
Surface baryta coated paper .....117 crates, 1 cs.
Metal covered paper .....18 cs.
Photo paper .....10 cs.
Tissue paper .....78 bbls., 74 cs.
Decalcomanias .....7 cs.
Letter paper .....4 cs.
Writing paper .....23 cs.
Fancy paper .....2 cs.
Cellophane paper .....1 cs.
Miscellaneous paper .....72 rolls, 10 bls., 79 cs.

CIGARETTE PAPER

American Tobacco Co., *Grande Terre*, Havre, 546 cs.
De Mauduit Paper Corp., *Grande Terre*, Havre, 2 cs.
De Mauduit Paper Corp., *Champlain*, Havre, 2 cs.
Champagne Paper Corp., *Champlain*, Havre, 305 cs.
Champagne Paper Corp., *American Banker*, Havre, 390 cs.

WALL PAPER

S. K. Lonegram, *Drottningholm*, Gothenburg, 2 bxs.
——, *Alaunia*, London, 11 bls. 17 cs.
——, *American Banker*, Havre, 12 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *Manhattan*, Southampton, 1 cs.
W. H. S. Lloyd & Co., *American Banker*, London, 4 bls., 2 cs.

PAINTED PAPER

A. L. Diament & Co., *Grande Terre*, Havre, 1 cs.

NEWSPRINT

International Paper Sales Co., *Haarfagre*, Dalhousie, 2845 rolls.
N. Y. Evening Journal, *Manhattan*, Finland, 248 rolls.
N. Y. Evening Journal, *Markland*, Liverpool, N. S., 501 rolls.
N. Y. Tribune, *Markland*, Liverpool, N. S., 1593 rolls.
World Telegram, *Markland*, Liverpool, N. S., 595 rolls.
Brooklyn Daily Eagle, *Markland*, Liverpool, N. S., 539 rolls.
Gilman Paper Co., *Markland*, Liverpool, N. S., 302 rolls.
Lunham & Reeve, Inc., *Scanyork*, Kotka, 135 rolls.
Jay Madden Corp., *Scanyork*, Kotka, 803 rolls.
News Syndicate Co., Inc., *Louisianan*, Comeau Bay 6307 rolls.
Perkins Goodwin & Co., *Hamburg*, Hamburg, 370 rolls.
——, *Hamburg*, Hamburg, 191 rolls.

PRINTING PAPER

Keuffel & Esser Co., *Manhattan*, Hamburg, 49 rolls.
S. H. Pomerance & Co., *Alaunia*, London, 1 cs.
Premier Shipping Co., *Alaunia*, Southampton, 1 cs.
Hester Lurner, *American Banker*, Havre, 1 cs.

WRAPPING PAPER

——, *Drottningholm*, Gothenburg, 283 rolls, 34 bls.
The Borregaard Co., Inc., *Drottningholm*, Gothenburg, 234 bls., 67 pkgs., 1833 rolls.
Jay Madden Corp., *Manhattan*, Finland, 206 rolls.

DRAWING PAPER

Keuffel & Esser Co., *Manhattan*, Hamburg, 15 cs.
H. Reeve Angel & Co. Inc., *Alaunia*, London, 9 cs.
Japan Paper Co., *American Banker*, London, 2 cs.
Keuffel & Esser Co., *Hamburg*, Hamburg, 35 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., *Alaunia*, London, 2 cs.
——, *American Banker*, London, 1 cs.

SURFACE BARYTA COATED PAPER

Globe Shipping Co., *Hamburg*, Hamburg, 1 cs., 117 crates.

METAL COVERED PAPER

K. Pauli & Co., *Hamburg*, Hamburg, 18 cs.

PHOTO PAPER

Medo Photo-Supply Co., *American Banker*, London, 2 cs.
American Express Co., *Hamburg*, Hamburg, 5 cs.
Heemsoth Kerner Corp., *Hamburg*, Hamburg, 5 cs.

TISSUE PAPER

Jay Madden Corp., *Scanyork* Helsingfors, 78 bls.
W. J. Byrnes, *Manhattan*, Southhampton, 3 cs. (coated).
W. J. Byrnes, *Queen Mary*, Southampton, 1 cs. (coated).
——, *Yamazato* Maru, Kobe, 70 cs.

DECALCOMANIAS

Sellers Transportation Co., *Hamburg*, Hamburg, 7 cs.

LETTER PAPER

H. W. Robinson & Co., *Manhattan*, Hamburg, 4 cs.

WRITING PAPER

H. W. Robinson & Co., *American Banker*, Havre, 23 cs.

FANCY PAPER

C. A. Haynes & Co., *American Banker*, London, 2 cs.

CELLOPHANE PAPER

Titan Shipping Co., *Queen Mary*, Southampton, 1 cs.

MISCELLANEOUS PAPER

——, *Drottningholm*, Gothenburg, 72 rolls.
H. Reeve Angel & Co. Inc., *Asakasan Maru*, Yokohama, 9 cs.
Remington Rand, Inc., *Yamazato Maru*, Kobe, 12 cs.
Japan Paper Co., *Yamazato Maru*, Kobe, 56 cs.
Rohner Gehrig & Co., *Grande Terre*, Havre, 10 bls.
H. W. Robinson & Co., *Champlain*, Havre, 2 cs.

BAGS, BAGGINGS, ETC.

——, *Collamer*, Havre, 18 bls. rags.
Loumar Textile By Products, Inc., *Collamer*, Havre, 98 bls. rags.
Manufacturers Trust Co., *Collamer*, Dunkirk, 43 bls. rags.
G. W. Miller & Co., Inc., *Collamer*, Dunkirk, 59 bls. new cuttings.
Darmstadt Scott & Courtney, *Scanyork*, Copenhagen, 102 bls. bagging.
A. W. Fenton & Co., Inc., *Alaunia*, London, 169 bls. bagging.
——, *Champlain*, Havre, 14 bls. bagging.
Commercial Bank of Greece, *Heimgar*, Piraeus, 48 bls. rags.
Guaranty Trust Co., *Heimgar*, Alexandria, 169 bls. rags.
Philadelphia National Bank, *Heimgar*, Alexandria, 85 bls. old cottons.
National City Bank, *Heimgar*, Alexandria, 54 bls. rags.
Irving Trust Co., *Heimgar*, Alexandria, 61 bls. rags, 96 bls. bagging.
E. J. Keller Co., Inc., *Heimgar*, ——, 238 bls. rags, 87 bls. bagging.
——, *Turksib*, Leningrad, 82 bls. linen rags.
Chase National Bank, *Turksib*, Leningrad, 1915 bls. linen rags, 1390 bls. flax waste.
American Express Co., *Turksib*, Leningrad, 96 bls. rags.

OLD ROPE

Chase National Bank, *American Banker*, London, 117 coils.
E. J. Keller Co., Inc., *Ingria*, ———, 72 coils.

WOOD PULP

M. Sone, *Pilsudski*, Gdynia, 310 bls. wood pulp, 52 tons.
———, *Pilsudski*, Gdynia, 120 bls. wood pulp, 20 tons.
Guaranty Trust Co., *Pilsudski*, Gdynia, 2625 bls. sulphite, 325 tons.
J. Anderson & Co., *Drottningholm*, Gothenburg, 125 bls. sulphite.
Pulp Specialties, Inc., *Drottningholm*, Gothenburg, 158 bls. sulphite.
Pulp Sales Corp., *Scanyork*, Kotka, 1050 bls. sulphite, 210 tons.
Perkins Goodwin & Co., *Mertainen*, Fagervik, 1200 bls. sulphite.
Bank of N. Y. Trust Co., *Mertainen*, Hernosand, 3000 bls. sulphite.
———, *Mertainen*, Iggesund, 3025 bls. sulphate, 500 bls. sulphite.
———, *Belos*, Wallvik, 750 bls. sulphite.
Perkins Goodwin & Co., *Belos*, Norrsundet, 750 bls. sulphate.
Bank of N. Y. Trust Co., *Hamburg*, Hamburg, 480 bls. wood pulp, 96 tons.
Castle & Overton, Inc., *Hamburg*, Hamburg, 130 bls. wood pulp, 26 tons.

WOOD PULP BOARDS

H. Fuchs & Son, *Drottningholm*, Gothenburg, 6 crates.
Jay Madden Corp., *Scanyork*, Kotka, 52 bls., 41 rolls.
W. Bersch, *Hamburg*, Hamburg, 150 bls.

ALBANY IMPORTS

WEEK ENDING DECEMBER 3, 1938

———, *Mertainen*, Gefle, 600 bls. sulphite.
Pagel Horton & Co., Inc., *Mertainen*, Gefle, 11000 bls. sulphite.
Gottesman & Co., Inc., *Mertainen*, Fagervik, 5910 bls. sulphite.
Gottesman & Co., Inc., *Mertainen*, Hernosand, 7200 bls. sulphite.
Gottesman & Co., Inc., *Mertainen*, Iggesund, 750 bls. sulphite.
Chase National Bank, *Mertainen*, Iggesund, 650 bls. sulphite.
———, *Mertainen*, Fagervik, 343 bls. wall board.

BOSTON IMPORTS

WEEK ENDING DECEMBER 3, 1938

E. J. Keller Co., Inc., *Collamer*, ———, 570 bls. rags.
Castle & Overton, Inc., *Collamer*, Havre, 591 bls. rags.
———, *Collamer*, Dunkirk, 33 bls. rags.
———, *Collamer*, Dunkirk, 31 bls. thread waste.
Price & Pierce, Ltd., *Belos*, ———, 1800 bls. unbleached sulphite, 2790 bls., unbleached sulphate.
Price & Pierce, Ltd., *Toledo*, ———, 750 bls. bleached sulphite.
———, *Exermont*, Istanbul, 8 cs. writing paper.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 3, 1938

Pulp Sales Corp., *Scanyork*, Helsingfors, 90 bls. sulphate, 17 tons.
Jay Madden Corp., *Scanyork*, Kotka, 85 bls. wood pulp boards, 7 tons.
Wilkinson Bros., & Co., Inc., *Scanyork*, Kotka, 320 rolls newsprint.
J. W. Hampton Jr., & Co., *Scanyork*, Kotka, 86 rolls newsprint.
Public Ledger, Inc., *Scanyork*, Kotka, 345 rolls newsprint.
Pulp Sales Corp., *Scanyork*, Kotka, 130 bls. mechanically ground pulp, 26 tons.
F. Whitaker & Co., *Scanyork*, Copenhagen, 86 bls. rags.
F. Whitaker & Co., *Lehigh*, Liverpool, 17 bls. bagging.
———, *Lehigh*, Liverpool, 110 coils old rope; 14 bls. cotton waste.
E. J. Keller Co., Inc., *Caoulin*, ———, 187 bls. paper stock.

BALTIMORE IMPORTS

WEEK ENDING DECEMBER 3, 1938

Washington Post, *Markland*, Liverpool, N. S., 2199 rolls newsprint.
Wilkinson Bros., & Co., Inc., *Scanyork*, Kotka, 120 rolls newsprint.
Pulp Sales Corp., *Scanyork*, Kotka, 2540 bls. mechanically ground pulp, 508 tons.
Bankers Trust Co., *Maria*, Trieste, 100 bls. wood pulp.
Gottesman & Co., Inc., *Vasaholm*, Sweden, 2000 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING DECEMBER 3, 1938

Gottesman & Co., Inc., *Vasaholm*, Sweden, 375 bls. wood pulp.
Price & Pierce, Ltd., *Vasaholm*, Sweden, 2944 bls. unbleached sulphite.

NEW ORLEANS IMPORTS

WEEK ENDING DECEMBER 3, 1938

———, *Maria*, Algiers, 300 bls. rags.

N. E. Paper Men To Have Guest Night

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 5, 1938—The New England Paper Merchants Association, in conjunction with the rest of the country, is to increase the membership, in an endeavor to make it 100 per cent representative of paper distribution in New England. Members have been asked to send to the acting secretary, Floyd H. Blackman, if they have not already done so, the names of any concerns they think should be members, so that the president can send them an invitation to attend the regular meeting, to be held at the Parker House, December 15 at 6 P. M., as guests of the association. The occasion will be guest night and past presidents night.

The directors of the association have given notice to members that the organization will be incorporated at this meeting.

Speakers who are expected include Brols Kilhour, Quaker City Paper Company, Philadelphia, Pa.; H. G. Travers, Ludlow Manufacturing Company; Maurice Dobrow, secretary of the Writing Paper Manufacturers Association, and A. R. Jackson, secretary of the Wrapping Division of the National Paper Trade.

Mellen Co. Install Casein Equipment

[FROM OUR REGULAR CORRESPONDENT]

MELLEN, Wis., December 5, 1938—Vats and other equipment have been installed in the Mellen Produce Company plant for the manufacture of casein. The entire output, 1,500 pounds daily, has been contracted for by the National Casein Company of New York City. J. E. Minton is general manager of the plant.

Carter, Rice Issue New Price Schedule

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 5, 1938—Carter, Rice & Co., Corp., has issued to the printing trade a new price schedule on papers which are immediately available and to be included in the Carter Rice price list. These papers comprise sulphite bonds, mimeographs and ledger papers. Some price reductions have been made.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, December 7, 1938.

The wholesale paper market reports received from manufacturers' representatives, jobbers and general paper merchants indicate that sales volume is keeping up well during the current week. The rise in general business activity which has continued for nearly two months has been checked. The index of general business activity dropped to 92.7, from 93.1 per cent for the preceding week, compared to 85.3 per cent for the corresponding period ended November 27, 1937. The production ratio of over 270 paper mills was estimated at 71.2 per cent for the week ended November 26 this year, compared to 58.0 per cent for the corresponding week of last year. The production of paper board stood at 57.0 per cent for the week ended November 26, compared to 50.0 per cent for the corresponding week last year.

This reversal of the upward trend in industry is partly attributed to the Thanksgiving Holiday and is generally viewed as merely of a temporary nature. Although somewhat less activity is expected in some durable goods industries, such as steel and automobiles, trade prospects for many lines of consumer goods, including paper, are considered better than average.

The consumption of newsprint continues to reflect improvement and this is expected to continue as reports from advertising circles indicate that more advertising lineage will likely appear in the future. The inventory situation is generally viewed as quite satisfactory and prices remain firm at prevailing levels.

Demand for many grades of paper continues relatively good for this week. The volume of orders in many grades of sulphite papers is well maintained. The demand for the more popular grades of writing papers continues good. The prevailing opinion is optimistic and while the consumption of some grades of paper is somewhat under trade expectations at this date, the wholesale paper trade as a whole is doing well. Prices are generally conceded to be low and remain firm, with little expectation at this time of any important changes from prevailing representative quoted market prices.

Mechanical Pulp

The demand for mechanical pulp continues at practically the same level as during the preceding week. Prices continue relatively firm and no important change in demand or prices is looked for in the trade in the near future.

Chemical Pulp

The market situation in chemical pulp continues unchanged during the current week. While the price of prime bleached sulphite pulp is currently quoted at $50 per ton, on dock, and this quotation is announced for the entire year of 1939, some sales are reported of lower grades at from $46 to $48 per ton, on dock. Prices of all grades of imported and domestic pulps remain unchanged for this week.

Old Rope and Bagging

Business in the old rope market continues to be reported as limited. Prices are unchanged. The demand for old bagging continues limited and prices remain at prevailing quotations.

Rags

The domestic rag market is reported as firm for the week, with collections somewhat lower, due in part to the unfavorable weather and to a falling off in supply from the cutting-up trades. New No. 1 white shirt cuttings are higher this week and currently quoted at from 7.00 to 7.25, f.o.b., New York. The foreign rag market is inactive and prices are nominal.

Old Waste Paper

The market situation in old waste paper continues unchanged with collections reported as lower. Prices continue unchanged, with the exception of white envelope cuttings which are lower this week and currently quoted at from 2.40 to 2.50. No. 1 white news is also reported a little lower and currently quoted at from 1.30 to 1.40.

Twine

No important change in demand or prices is reported in the twine market. Prevailing prices continue relatively firm on all grades of twine.

Philadelphia To Hold Christmas Dinner

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 5, 1938—On December 21st, the Paper Trade Association of Philadelphia, plans to hold a Christmas dinner for the entire membership and their guests; the place where the dinner will be held has not definitely been decided on as yet. Reservations have been pouring in from members of both the fine and wrapping paper divisions of the association. President W. B. Kilhour will preside, and among the guest speakers will be Arthur Chamberlin, executive secretary of the National Paper Trade Association.

Hooper Paper & Twine Co. Busy

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 5, 1938—As a concrete evidence of improvement in the sales made by the Hooper Paper and Twine Company, Mr. Hooper announces that he has added another brand new truck to take care of this additional business, and the Hooper Company has also supplemented its extensive lines of paper with that of Permanized Papers, manufactured by Whiting-Plover Paper Company, Stevens Point, Wis., having been appointed dual service house for the entire line of Permanized Papers.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, December 7, 1938.

ALUM (Activated)—Quotations on activated alum continue firm and conform to prevailing market prices. The commercial grades are quoted at $.90 per 100 pounds, in 100 pound multi-wall bags, car lots, f.o.b., works.

BLANC FIXE—Prices of blanc fixe are firm and unchanged at prevailing quotations. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER — Quotations on bleaching powder remain firm and conform to prevailing market levels. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein continues moderately good. Prices remain firm and unchanged. Standard domestic casein, 20-30 mesh, is quoted at from 8½ to 9 cents per pound; 80-100 mesh at from 9 to 9½ cents per pound. All prices in bags, car lot quantities.

CAUSTIC SODA—Quotations on caustic soda continue firm at prevailing market levels. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds; in drums, at works.

CHINA CLAY—Prices of china clay continue steady at prevailing market levels. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Quotations on chlorine continue firm under a steady demand and conform to prevailing market quotations. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as fair for the week. "G" gum rosin is quoted at $4.35; "FF" wood rosin at $4.20 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is offered at $2.56 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake continue firm under a steady demand. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—The demand for soda ash continues steady; prices remain firm and conform to prevailing market levels. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—Quotations on corn starch continue firm and conform to prevailing market levels. Globe pearl is quoted at $2.50 per 100 pounds, in bags. Special paper starch is quoted at $2.60 per 100 pounds, in bags. All prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Prices of sulphate of alumina continue firm and are unchanged at prevailing market levels. The commercial grades are quoted at $1.15; iron free at $1.30 per 100 pounds, in barrels, car lot quantities, f.o.b., works.

SULPHUR—Prices of sulphur remain firm under a good demand and conform to prevailing market quotations. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Quotations on talc remain firm and unchanged at prevailing market levels. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$4.75	@	$5.25
Superstandard	4.12½	@	4.62½
Northern Standard Wrapping	4.00	@	—
Standard Wrapping	3.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.20	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.80	@	—
Bleached	2.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	9.75
No. 2 Jute	7.50	@	9.00
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	27.50	@	30.00
Chip	27.50	@	30.00
Sgl. Mla. Ll. Chip	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated	55.00	@	57.50
Kraft Liners	42.50	@	50.00
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	31.05@ 36.50	32.20@ 37.75
85% Rag	.....	29.90@ 35.00
75% Rag	23.60@ 27.75	24.75@ 29.00
65% Rag	.....	21.65@ 26.25
50% Rag	17.55@ 21.50	18.70@ 22.75
25% Rag	14.65@ 17.75	15.80@ 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$8.20@$10.00	$9.35@$11.50
No. 2	7.30@ 9.00	8.50@ 10.25
No. 4	6.45@ 7.75	7.60@ 9.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$10.80	@	$12.50
No. 2 Glossy Coated	9.25	@	10.75
No. 3 Glossy Coated	8.15	@	9.50
No. 4 Glossy Coated	7.65	@	9.00
No. 1 Antique (watermarked)	7.65	@	9.00
No. 2 Offset	7.00	@	8.25
A Grade E. F.	6.80	@	8.00
A Grade S. & S. C.	7.05	@	8.25
B Grade E. F.	6.25	@	7.50
B Grade S. & S. C.	6.50	@	7.75
C Grade E. F.	6.00	@	7.00
C Grade S. & S. C.	6.25	@	7.25
D Grade E. F.	5.70	@	6.75
D Grade S. & S. C.	5.95	@	7.00

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	25.00	@	28.00
Dry	25.00	@	28.00
(Delivered)			
No. 1 Domestic and Canadian	29.00	@	33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.35	@	2.75
Prime Qualities—Easy-Bleaching Sulphite	1.90	@	2.10
Strong Unbleached Sulphite	1.80	@	2.00
(On Dock, Atlantic Ports)			
Kraft Bleached	2.25	@	2.75
Kraft Light & Strong	1.75	@	1.85
Kraft No. 1	1.55	@	1.75
Kraft No. 2	1.50	@	1.55
(F. o. b. Pulp Mill)			
Kraft Domestic	1.25	@	1.75
(Delivered)			
Soda Bleached	2.55	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.00	@	7.25
Silesias No. 1	4.00	@	4.25
New Unbleached	6.75	@	7.00
Blue Overall	5.00	@	5.25
Fancy	2.10	@	2.25
Washables	1.60	@	1.70
Mixed Khaki Cuttings	3.25	@	3.75
O. D. Khaki Cuttings	4.00		4.25

Old Rags

White, No. 1—			
Repacked	3.15	@	3.40
Miscellaneous	2.60	@	2.75
White, No. 2—			
Repacked	1.90	@	2.10
Miscellaneous	1.50	@	1.60
Thirds and Blues—			
Repacked	1.40	@	1.50
Miscellaneous	1.25	@	1.30
Roofing Rags—			
No. 1	1.15	@	1.20
No. 2	.90	@	1.00
No. 3 (bagging)	.85	@	.90
No. 4	.65	@	.70
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—

J. Andersen & Co.
Selling Agents
21 East 40th Street
New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KAMK TRÄINDUSTRI AKTIEBOLAG
Vansaffärden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
MENSJÖ CELLULOSA A.-B.
Sprängsviken, Sweden

Bleached Sulphite
KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

Unbleached Sulphite
AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bruckbera, Czecho-Slovakia
SVANÖ AKTIEBOLAG
Svanö, Sweden

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856

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Perforated Screens
For Pulp and Paper Mills
Steel, Copper, Brass
Bronze, Monel Metal
and Other Alloys
Punched for Centrifugal
and Rotary Screens,
Pulp Washers, Drainer
Bottoms, Filter Plates, etc.
Charles Mundt & Sons
67 Fairmount Ave. Jersey City, N. J.

ENGLISH ECCO CLAYS CLAYS
TRADE MARK
UNIFORM • SUPERIOR • DEPENDABLE
English China Clays Sales Corporation
551 Fifth Avenue, New York City

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons.	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.40	@	2.50
Domestic	2.25	@	2.35
Wool Tares, light...	1.80	@	1.90
Wool Tares, heavy...	1.90	@	2.00
Bright Bagging.....	1.70	@	1.80
Manila Rope—			
Foreign	2.60	@	2.75
Domestic	2.50	@	2.75
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.50	@	1.60
Mixed Strings.....	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.40	@	2.50
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.75	@	1.80
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag.....	.70	@	.75
Solid Flat Book...	.60	@	.65
Crumbled No. 1....	.40	@	.45
Ledger Stock White.	1.15	@	1.25
Ledger Stock Colored	.65	@	.70
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut.....	1.40	@	1.50
New Cuttings.....	1.25	@	1.35
Old Kraft Machine— Compressed bales..	.65	@	.75
News—			
No. 1 White News	1.30	@	1.40
Strictly Overissue..	.50	@	.55
Strictly Folded....	.30	@	.35
No. 1 Mixed Paper..	.15	@	.20

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.11	@	.13
White Hemp.....	.12	@	.14
Fine Polished—			
Fine India.....	.15	@	.17
Unpolished—			
Box	.08½	@	—
Paper Makers.....	.07½	@	.08½
Tube Rope.....	.09	@	.10
Wall Paper.....	.10	@	.11
Wrapping	.11	@	.13
Soft Fiber Rope...	.09½	@	.11½
Cotton	.17	@	.22

(Hard Fiber)

Medium Java.....	.10	@	.16
Mex. Sisal.....	.09	@	.15
Manila	.18	@	.25

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06¼
New White, No. 2.	.03½	@	.04
Light Silesias.....	.03½	@	.04
Silesias, No. 1....	—	@	.04½
Black Silesias, soft	—	@	.03
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01½	@	.01¾
Blue Overall.....	.04	@	.04½
Cottons—Acording to grades—			
Washable No. 2...	.01	@	.01¼
New Blue.....	.01	@	.01¼
Fancy Percales....	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	.95
Domestic No. 1...	—	@	.95
Domestic No. 2...	—	@	.85
Roofing Bagging..	—	@	.60

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	2.00
Domestic	1.50	@	1.75
Manila Rope.....	—	@	3.50
Sisal Rope.....	1.50	@	1.75
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.75
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	.75	@	1.00
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.25	@	2.30
No. 2 Hard White.	1.90	@	2.00
No. 1 Soft White..	1.75	@	1.80
No. 2 Soft White..	1.30	@	1.40
No. 1 Mixed.....	.65	@	.75
Solid Ledger Stock..	1.45	@	1.50
Ledger Stock, white.	1.15	@	1.20
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy..	.60	@	.75
Manila Cuttings.....	1.45	@	1.50
Print Manila.....	.40	@	.45
Container Manila....	.35	@	.40
Kraft Paper.....	.75	@	.80
No. 1 Mixed Paper..	.20	@	.25
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.40	@	.45
Old Newspapers.....	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy...	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.85	@	2.00
Manila Envelope Cuttings, extra quality.	2.00	@	2.10
No. 1 Old Manila...	.80	@	.90
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.90	@	—
Mixed Papers.....	.15	@	—
Print Manila.....	.45	@	.55
Container Manilas...	.27½	@	—
Old Newspapers.....	.25	@	.32½
Paper Wool Strings..	.65	@	.75
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes....	.30	@	.35
Kraft corrugated boxes	.65	@	.70
Screening Wrappers..	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.65	@	2.75
Domestic	2.65	@	2.75
Sisal Rope.....	1.65	@	1.85
Mixed Rope.....	.50	@	.75
Transmission Rope...	1.90	@	2.00
Soft Jute Rope.....	1.90	@	2.10
Jute Carpet Threads.	.75	@	.90
Gunny Bagging—			
Foreign	2.00	@	—
Domestic	1.75	@	1.85
Bleachery Burlap....	3.25	@	3.50
Scrap Burlap—			
Foreign	1.60	@	—
Domestic	1.40	@	1.55
Scrap Sisal.....	1.25	@	1.50
Scrap Sisal for Shredding	1.50	@	1.65
Wool Tares, Heavy..	1.60	@	1.65
New Burlap Cuttings	2.00	@	2.25
Aust. Wool Pouches.	2.75	@	3.25
Heavy baling bagging	1.75	@	1.85
Paper Mill Bagging..	1.00	@	1.15
No. 2 Bagging.....	.55	@	.75

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03½
New White No. 1...	.06¾	@	.07
New Light Flannelettes	.04¼	@	.04¾
Silesias No. 1.....	.04¼	@	.04½
New Black Silesias..	.03¾	@	.04
Silesias No. 1			
Soft Unbleached.....	6.50	@	7.00
Blue Cheviots.....	.05	@	.05¼
Fancy	.03	@	.03¼
Washable	.02¾	@	.03
Cottons—According to grades—			
Blue Overalls.....	.04¾	@	.05
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.03	@	.03½
O. D. Khaki.....	.04	@	.04¼
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B.V.D. Cuttings.....	—	@	.06½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Old Blue Overalls...	1.50	@	—
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.63¾
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.05	@	1.15
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments	2.20	@	2.25
New Silesias.....	4.75	@	—

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila.....	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.30
Roofing Stocks—			
No. 1.....	1.00	@	1.05
No. 2.....	.85	@	—

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots

No. 1 White .....$	35.50	@	—
No. 1 Tints	36.50	@	—
No. 2 White	25.50	@	—
No. 2 Tints	26.50	@	—
No. 2 Golden Rod..	27.50	@	—
No. 3 White	21.00	@	—
No. 4 White	15.00	@	—
No. 4 Tints	16.00	@	—
No. 4 Golden Rod..	17.00	@	—

Direct mill shipment in three-ton lots

No. 5 White .....$	10.50	@	—
No. 5 Tints	11.50	@	—
No. 5 Golden Rod..	12.00	@	—
No. 6 White	9.00	@	—
No. 6 Tints	9.50	@	—
No. 6 Golden Rod..	11.00	@	—
No. 7 White	8.00	@	—
No. 7 Tints	8.50	@	—
No. 7 Golden Rod..	10.00	@	—
Book—			
No. 1 M. F. ..... $	7.00	@	—
No. 2 M. F.	6.50	@	—
No. 3 M. F.	5.25	@	—
No. 1 S. C.	7.25	@	—
No. 2 S. C.	6.75	@	—
No. 3 S. C.	5.75	@	—

Coated Book & Litho

Ton Lots (resale)

No. 1 .....$	12.00	@	—
No. 2	10.25	@	—
No. 3	8.90	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.25
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.15
No. 1 Manila.....	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2.....	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)...$	46.00	@	—
Sheets .....$	54.00	@	—

Pulp

Ground wood.....$	29.00	@	—
Unbleached Sulphite.	49.00	@	—
Kraft .....$	50.00	@	—
Soda .....$	54.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.25	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	—
Light and Crumpled Book Stock.	.70	@	—
Ledgers and Writings	1.10	@	—
Manilas—			
New Manila Cut..	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue..	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to Mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Fancy Shirt Cuttings	.02¼	@	.03½